INTERNATIONAL FOOTNOTES

5.53--Administrations authorizing the use of frequencies below 9 kHz shall ensure that no harmful interference is caused thereby to the services to which the bands above 9 kHz are allocated.

5.54--Administrations conducting scientific research using frequencies below 9 kHz are urged to advise other administrations that may be concerned in order that such research may be afforded all practicable protection from harmful interference.

5.56--The stations of services to which the bands 14-19.95 kHz and 20.05-70 kHz and in Region 1 also the bands 72-84 kHz and 86-90 kHz are allocated may transmit standard frequency and time signals. Such stations shall be afforded protection from harmful interference. In Armenia, Azerbaijan, Belarus, Bulgaria, the Russian Federation, Georgia, Kazakhstan, Mongolia, Kyrgyzstan, Slovakia, the Czech Rep., Tajikistan and Turkmenistan, the frequencies 25 kHz and 50 kHz will be used for this purpose under the same conditions. (WRC-03)

5.57--The use of the bands 14-19.95 kHz, 20.05-70 kHz and 70-90 kHz (72-84 kHz and 86-90 kHz in Region 1) by the maritime mobile service is limited to coast radiotelegraph stations (A1A and F1B only). Exceptionally, the use of class J2B or J7B emissions is authorized subject to the necessary bandwidth not exceeding that normally used for class A1A or F1B emissions in the band concerned.

5.58--*Additional allocation:* in Armenia, Azerbaijan, Georgia, Kazakstan, Kyrgyzstan, the Russian Federation, Tajikistan and Turkmenistan, the band 67-70 kHz is also allocated to the radionavigation service on a primary basis.

5.59--*Different category of service:* in Bangladesh and Pakistan, the allocation of the bands 70-72 kHz and 84-86 kHz to the fixed and maritime mobile services is on a primary basis (see No. **5.33)**.

5.60--In the bands 70-90 kHz (70-86 kHz in Region 1) and 110-130 kHz (112-130 kHz in Region 1), pulsed radionavigation systems may be used on condition that they do not cause harmful interference to other services to which these bands are allocated.

5.61--In Region 2, the establishment and operation of stations in the maritime radionavigation service in the bands 70-90 kHz and 110-130 kHz shall be subject to agreement obtained under No. 9.21 with administrations whose services, operating in accordance with the Table, may be affected. However, stations of the fixed, maritime mobile and radiolocation services shall not cause harmful interference to stations in the maritime radionavigation service established under such agreements.

5.62--Administrations which operate stations in the radionavigation service in the band 90-110 kHz are urged to coordinate technical and operating characteristics in such a way as to avoid harmful interference to the services provided by these stations.

5.64--Only classes A1A or F1B, A2C, A3C, F1C or F3C emissions are authorized for stations of the fixed service in the bands allocated to this service between 90 kHz and 160 kHz (148.5 kHz in Region 1) and for stations of the maritime mobile service in the bands allocated to this service between 110 kHz and 160 kHz (148.5 kHz in Region 1). Exceptionally, class J2B or J7B emissions are also authorized in the bands between 110 kHz and 160 kHz (148.5 kHz in Region 1) for stations of the maritime mobile service.

5.65--*Different category of service:* in Bangladesh, the allocation of the bands 112-117.6 kHz and 126-129 kHz to the fixed and maritime mobile services is on a primary basis (see No. **5.33**).

5.66--*Different category of service:* in Germany, the allocation of the band 115-117.6 kHz to the fixed and maritime mobile services is on a primary basis (see No. **5.33**) and to the radionavigation service on a secondary basis (see No. **5.32**).

5.67--*Additional allocation:* in Azerbaijan, Bulgaria, Mongolia, Kyrgyzstan, Romania and Turkmenistan, the band 130-148.5 kHz is also allocated to the radionavigation service on a secondary basis. Within and between these countries this service shall have an equal right to operate.

5.68--*Alternative allocation:* in Angola, Burundi, Congo (Rep. of the), Malawi, Dem. Rep. of the Congo, Rwanda and South Africa, the band 160-200 kHz is allocated to the fixed service on a primary basis. (WRC-03)

5.69--*Additional allocation:* in Somalia, the band 200-255 kHz is also allocated to the aeronautical radionavigation service on a primary basis.
5.70--*Alternative allocation:* in Angola, Botswana, Burundi, Cameroon, the Central African Rep., Congo (Rep. of the), Ethiopia, Lesotho, Madagascar, Malawi, Mozambique, Namibia, Nigeria, Oman, Dem. Rep. of the Congo, Rwanda, South Africa, Swaziland, Tanzania, Chad, Zambia and Zimbabwe, the band 200-283.5 kHz is allocated to the aeronautical radionavigation service on a primary basis (WRC-03)
5.71--*Alternative allocation:* in Tunisia, the band 255-283.5 kHz is allocated to the broadcasting service on a primary basis.
5.72--Norwegian stations of the fixed service situated in northern areas (north of 60° N) subject to auroral disturbances are allowed to continue operation on four frequencies in the bands 283.5-490 kHz and 510-526.5 kHz.
5.73--The band 285-325 kHz (283.5-325 kHz in Region 1) in the maritime radionavigation service may be used to transmit supplementary navigational information using narrow-band techniques, on condition that no harmful interference is caused to radiobeacon stations operating in the radionavigation service.
5.74--*Additional Allocation:* in Region 1, the frequency band 285.3-285.7 kHz is also allocated to the maritime radionavigation service (other than radiobeacons) on a primary basis.
5.75--*Different category of service:* in Armenia, Azerbaijan, Belarus, Georgia, Moldova, Kyrgyzstan, the Russian Federation, Tajikistan, Turkmenistan, Ukraine and the Black Sea areas of Bulgaria and Romania, the allocation of the band 315-325 kHz to the maritime radionavigation service is on a primary basis under the condition that in the Baltic Sea area, the assignment of frequencies in this band to new stations in the maritime or aeronautical radionavigation services shall be subject to prior consultation between the administrations concerned.
5.76--The frequency 410 kHz is designated for radio direction-finding in the maritime radionavigation service. The other radionavigation services to which the band 405-415 kHz is allocated shall not cause harmful interference to radio direction-finding in the band 406.5-413.5 kHz.
5.77--*Different category of service:* in Australia, China, the French Overseas Territories of Region 3, India, Indonesia (until 1 January 2005), Iran (Islamic Republic of), Japan, Pakistan, Papua New Guinea and Sri Lanka, the allocation of the band 415-495 kHz to the aeronautical radionavigation service is on a primary basis. Administrations in these countries shall take all practical steps necessary to ensure that aeronautical radionavigation stations in the band 435-495 kHz do not cause interference to reception by coast stations of ship stations transmitting on frequencies designated for ship stations on a worldwide basis (see No. **52.39**).
5.78--*Different category of service:* in Cuba, the United States of America and Mexico, the allocation of the band 415-435 kHz to the aeronautical radionavigation service is on a primary basis.
5.79--The use of the bands 415-495 kHz and 505-526.5 kHz (505-510 kHz in Region 2) by the maritime mobile service is limited to radiotelegraphy.
5.79A--When establishing coast stations in the NAVTEX service on the frequencies 490 kHz, 518 kHz and 4 209.5 kHz, administrations are strongly recommended to coordinate the operating characteristics in accordance with the procedures of the International Maritime Organization (IMO)(see Resolution **339 (Rev.WRC-97)**).
5.80--In Region 2, the use of the band 435-495 kHz by the aeronautical radionavigation service is limited to non-directional beacons not employing voice transmission.
5.82--In the maritime mobile service, the frequency 490 kHz is, from the date of full implementation of the GMDSS (see Resolution **331 (Rev.WRC-97)**), to be used exclusively for the transmission by coast stations of navigational and meteorological warnings and urgent information to ships, by means of narrow-band direct-printing telegraphy. The conditions for use of the frequency 490 kHz are prescribed in Articles **31** and **52**. In using the band 415-495 kHz for the aeronautical radionavigation service, administrations are requested to ensure that no harmful interference is caused to the frequency 490 kHz.
5.83--The frequency 500 kHz is an international distress and calling frequency for Morse radiotelegra-

phy. The conditions for its use are prescribed in Articles **31** and **52,** and in Appendix **13**.

5.84--The conditions for the use of the frequency 518 kHz by the maritime mobile service are prescribed in Articles **31** and **52** and in Appendix **13**.

5.86--In Region 2, in the band 525-535 kHz the carrier power of broadcasting stations shall not exceed 1 kW during the day and 250 W at night.

5.87--*Additional allocation:* in Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland and Zimbabwe, the band 526.5-535 kHz is also allocated to the mobile service on a secondary basis. (WRC-03)

5.87A--*Additional allocation:* in Uzbekistan, the band 526.5-1606.5 kHz is also allocated to the radionavigation service on a primary basis. Such use is subject to agreement obtained under No. **9.21** with administrations concerned and limited to ground-based radiobeacons in operation on 27 October 1997 until the end of their lifetime.

5.88--*Additional allocation:* in China, the band 526.5-535 kHz is also allocated to the aeronautical radionavigation service on a secondary basis.

5.89--In Region 2, the use of the band 1605-1705 kHz by stations of the broadcasting service is subject to the Plan established by the Regional Administrative Radio Conference (Rio de Janeiro, 1988).

The examination of frequency assignments to stations of the fixed and mobile services in the band 1625-1705 kHz shall take account of the allotments appearing in the Plan established by the Regional Administrative Radio Conference (Rio de Janeiro, 1988).

5.90--In the band 1605-1705 kHz, in cases where a broadcasting station of Region 2 is concerned, the service area of the maritime mobile stations in Region 1 shall be limited to that provided by ground-wave propagation.

5.91--*Additional allocation:* in the Philippines and Sri Lanka, the band 1606.5-1705 kHz is also allocated to the broadcasting service on a secondary basis.

5.92--Some countries of Region 1 use radiodetermination systems in the bands 1606.5-1625 kHz, 1635-1800 kHz, 1850-2160 kHz, 2194-2300 kHz, 2502-2850 kHz and 3500-3800 kHz, subject to agreement obtained under No. **9.21**. The radiated mean power of these stations shall not exceed 50 W.

5.93--*Additional allocation:* in Angola, Armenia, Azerbaijan, Belarus, Georgia, Hungary, Kazakstan, Latvia, Lithuania, Moldova, Mongolia, Nigeria, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Rep., the Russian Federation, Tajikistan, Chad, Turkmenistan and Ukraine, the bands 1625-1635 kHz, 1800-1810 kHz and 2160-2170 kHz and, in Bulgaria, the bands 1625-1635 kHz and 1800-1810 kHz, are also allocated to the fixed and land mobile services on a primary basis, subject to agreement obtained under No. **9.21**.

5.96--In Germany, Armenia, Austria, Azerbaijan, Belarus, Denmark, Estonia, the Russian Federation, Finland, Georgia, Hungary, Ireland, Iceland, Israel, Kazakhstan, Latvia, Liechtenstein, Lithuania, Malta, Moldova, Norway, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Rep., the United Kingdom, Sweden, Switzerland, Tajikistan, Turkmenistan and Ukraine, administrations may allocate up to 200 kHz to their amateur service in the bands 1 715-1 800 kHz and 1 850-2 000 kHz. However, when allocating the bands within this range to their amateur service, administrations shall, after prior consultation with administrations of neighbouring countries, take such steps as may be necessary to prevent harmful interference from their amateur service to the fixed and mobile services of other countries. The mean power of any amateur station shall not exceed 10 W. (WRC-03)

5.97--In Region 3, the Loran system operates either on 1 850 kHz or 1 950 kHz, the bands occupied being 1825-1875 kHz and 1925-1975 kHz respectively. Other services to which the band 1 800-2 000 kHz is allocated may use any frequency therein on condition that no harmful interference is caused to the Loran system operating on 1 850 kHz or 1 950 kHz.

5.98--*Alternative allocation:* In Angola, Armenia, Azerbaijan, Belarus, Belgium, Bulgaria, Cameroon, Congo (Rep. of the), Denmark, Egypt, Eritrea, Spain, Ethiopia, the Russian Federation, Georgia, Greece, Italy, Kazakhstan, Lebanon, Lithuania, Moldova, Syrian Arab Republic, Kyrgyzstan, Somalia,

Tajikistan, Tunisia, Turkmenistan, Turkey and Ukraine, the band 1 810-1 830 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-03)

5.99--*Additional allocation:* in Saudi Arabia, Austria, Bosnia and Herzegovina, Iraq, Libyan Arab Jamahiriya, Uzbekistan, Slovakia, Romania, Serbia and Montenegro. Slovenia, Chad, and Togo, the band 1 810-1 830 kHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-03)

5.100--In Region 1, the authorization to use the band 1810-1830 kHz by the amateur service in countries situated totally or partially north of 40° N shall be given only after consultation with the countries mentioned in Nos. **5.98** and **5.99** to define the necessary steps to be taken to prevent harmful interference between amateur stations and stations of other services operating in accordance with Nos. **5.98** and **5.99**.

5.101--*Alternative allocation:* in Burundi and Lesotho, the band 1810-1850 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

5.102--*Alternative allocation:* in Argentina, Bolivia, Chile, Mexico, Paraguay, Peru, Uruguay and Venezuela, the band 1850-2000 kHz is allocated to the fixed, mobile except aeronautical mobile, radiolocation and radionavigation services on a primary basis.

5.103--In Region 1, in making assignments to stations in the fixed and mobile services in the bands 1 850-2 045 kHz, 2 194-2 498 kHz, 2 502-2 625 kHz and 2 650-2 850 kHz, administrations should bear in mind the special requirements of the maritime mobile service.

5.104--In Region 1, the use of the band 2 025-2 045 kHz by the meteorological aids service is limited to oceanographic buoy stations.

5.105--In Region 2, except in Greenland, coast stations and ship stations using radiotelephony in the band 2065-2107 kHz shall be limited to class J3E emissions and to a peak envelope power not exceeding 1 kW. Preferably, the following carrier frequencies should be used: 2 065.0 kHz, 2 079.0 kHz, 2 082.5 kHz, 2 086.0 kHz, 2 093.0 kHz, 2 096.5 kHz, 2 100.0 kHz and 2 103.5 kHz. In Argentina and Uruguay, the carrier frequencies 2 068.5 kHz and 2 075.5 kHz are also used for this purpose, while the frequencies within the band 2 072-2 075.5 kHz are used as provided in No. **52.165**.

5.106--In Regions 2 and 3, provided no harmful interference is caused to the maritime mobile service, the frequencies between 2065 kHz and 2107 kHz may be used by stations of the fixed service communicating only within national borders and whose mean power does not exceed 50 W. In notifying the frequencies, the attention of the Bureau should be drawn to these provisions.

5.107--*Additional allocation:* in Saudi Arabia, Eritrea, Ethiopia, Iraq, Lesotho, Libyan Arab Jamahiriya, Somalia and Swaziland, the band 2 160-2 170 kHz is also allocated to the fixed and mobile, except aeronautical mobile (R), services on a primary basis. The mean power of stations in these services shall not exceed 50 W. (WRC-03)

5.108--The carrier frequency 2182 kHz is an international distress and calling frequency for radiotelephony. The conditions for the use of the band 2 173.5-2 190.5 kHz are prescribed in Articles **31** and 52 and in Appendix **13**.

5.109--The frequencies 2 187.5 kHz, 4 207.5 kHz, 6 312 kHz, 8 414.5 kHz, 12 577 kHz and 16 804.5 kHz are international distress frequencies for digital selective calling. The conditions for the use of these frequencies are prescribed in Article **31**.

5.110--The frequencies 2 174.5 kHz, 4 177.5 kHz, 6 268 kHz, 8 376.5 kHz, 12 520 kHz and 16 695 kHz are international distress frequencies for narrow-band direct-printing telegraphy. The conditions for the use of these frequencies are prescribed in Article **31**.

5.111--The carrier frequencies 2 182 kHz, 3 023 kHz, 5 680 kHz, 8 364 kHz and the frequencies 121.5 MHz, 156.8 MHz and 243 MHz may also be used, in accordance with the procedures in force for terrestrial radiocommunication services, for search and rescue operations concerning manned space vehicles. The conditions for the use of the frequencies are prescribed in Article **31** and in Appendix **13**.

The same applies to the frequencies 10 003 kHz, 14 993 kHz and 19 993 kHz, but in each of these cases emissions must be confined in a band of ± 3 kHz about the frequency.

5.112--*Alternative allocation:* in Bosnia and Herzegovina, Denmark, Malta, Serbia and Montenegro. and Sri Lanka, the band 2 194-2 300 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-03)

5.113--For the conditions for the use of the bands 2 300-2 495 kHz (2 498 kHz in Region 1), 3 200-3 400 kHz, 4 750-4 995 kHz and 5 005-5 060 kHz by the broadcasting service, see Nos. **5.16** to **5.20**, **5.21** and **23.3** to **23.10**.

5.114--*Alternative allocation:* In Bosnia and Herzegovina, Denmark, Iraq, Malta, and Serbia and Montenegro, the band 2 502-2 625 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-03)

5.115--The carrier (reference) frequencies 3 023 kHz and 5 680 kHz may also be used, in accordance with Article **31** and Appendix **13** by stations of the maritime mobile service engaged in coordinated search and rescue operations.

5.116--Administrations are urged to authorize the use of the band 3 155-3 195 kHz to provide a common worldwide channel for low power wireless hearing aids. Additional channels for these devices may be assigned by administrations in the bands between 3 155 kHz and 3 400 kHz to suit local needs.

It should be noted that frequencies in the range 3 000 kHz to 4 000 kHz are suitable for hearing aid devices which are designed to operate over short distances within the induction field.

5.117--*Alternative allocation:* in Bosnia and Herzegovina, Côte d'Ivoire, Denmark, Egypt, Liberia, Malta, Serbia and Montenegro, Sri Lanka and Togo, the band 3 155-3 200 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-03)

5.118--*Additional allocation:* in the United States, Mexico, Peru and Uruguay, the band 3 230-3 400 kHz is also allocated to the radiolocation service on a secondary basis. (WRC-03)

5.119--*Additional allocation:* in Honduras, Mexico, Peru and Venezuela, the band 3 500-3 750 kHz is also allocated to the fixed and mobile services on a primary basis.

5.120--(SUP - WRC-2000)

5.121--Not used.

5.122--*Alternative allocation:* in Argentina, Bolivia, Chile, Ecuador, Paraguay, Peru and Uruguay, the band 3 750-4 000 kHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

5.123--*Additional allocation:* in Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe, the band 3 900-3 950 kHz is also allocated to the broadcasting service on a primary basis, subject to agreement obtained under No. **9.21**.

5.125--*Additional allocation:* in Greenland, the band 3 950-4 000 kHz is also allocated to the broadcasting service on a primary basis. The power of the broadcasting stations operating in this band shall not exceed that necessary for a national service and shall in no case exceed 5 kW.

5.126--In Region 3, the stations of those services to which the band 3 995-4 005 kHz is allocated may transmit standard frequency and time signals.

5.127--The use of the band 4 000-4 063 kHz by the maritime mobile service is limited to ship stations using radiotelephony (see No. **52.220** and Appendix **17**).

5.128--In Afghanistan, Argentina, Armenia, Azerbaijan, Belarus, Botswana, Burkina Faso, the Central African Rep., China, Georgia, India, Kazakstan, Mali, Niger, Kyrgyzstan, Russian Federation, Tajikistan, Chad, Turkmenistan and Ukraine, in the bands 4 063-4 123 kHz, 4 130-4 133 kHz and 4 408-4 438 kHz, stations of limited power in the fixed service which are situated at least 600 km from the coast may operate on condition that harmful interference is not caused to the maritime mobile service.

5.129--On condition that harmful interference is not caused to the maritime mobile service, the frequencies in the bands 4 063-4 123 kHz and 4 130-4 438 kHz may be used exceptionally by stations in the fixed service communicating only within the boundary of the country in which they are located with a mean power not exceeding 50 W.

5.130--The conditions for the use of the carrier frequencies 4 125 kHz and 6 215 kHz are prescribed in

Articles **31** and **52** and in Appendix **13**.

5.131--The frequency 4 209.5 kHz is used exclusively for the transmission by coast stations of meteorological and navigational warnings and urgent information to ships by means of narrow-band direct-printing techniques.

5.132--The frequencies 4 210 kHz, 6 314 kHz, 8 416.5 kHz, 12 579 kHz, 16 806.5 kHz, 19 680.5 kHz, 22 376 kHz and 26 100.5 kHz are the international frequencies for the transmission of maritime safety information (MSI) (see Appendix **17**).

5.133--*Different category of service:* in Armenia, Azerbaijan, Belarus, Georgia, Kazakstan, Latvia, Lithuania, Moldova, Uzbekistan, Kyrgyzstan, Russian Federation, Tajikistan, Turkmenistan and Ukraine, the allocation of the band 5130-5250 kHz to the mobile, except aeronautical mobile, service is on a primary basis (see No. **5.33**).

5.134--The use of the bands 5 900-5 950 kHz, 7 300-7 350 kHz, 9 400-9 500 kHz, 11 600-11 650 kHz, 12 050-12 100 kHz, 13 570-13 600 kHz, 13 800-13 870 kHz, 15 600-15 800 kHz, 17 480-17 550 kHz and 18 900- 19 020 kHz by the broadcasting service as from 1 April 2007 is subject to the application of the procedure of Article **12**. Administrations are urged to use these bands to facilitate the introduction of digitally modulated emissions in accordance with the provisions of Resolution **517 (Rev.WRC-03)**. (WRC-03)

5.136--The band 5 900-5 950 kHz is allocated, until 1 April 2007, to the fixed service on a primary basis, as well as to the following services: in Region 1 to the land mobile service on a primary basis, in Region 2 to the mobile except aeronautical mobile (R) service on a primary basis, and in Region 3 to the mobile except aeronautical mobile (R) service on a secondary basis, subject to application of the procedure referred to in Resolution **21 (Rev.WRC-95)**. After 1 April 2007, frequencies in this band may be used by stations in the above-mentioned services, communicating only within the boundary of the country in which they are located, on the condition that harmful interference is not caused to the broadcasting service. When using frequencies for these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations.

5.137--On condition that harmful interference is not caused to the maritime mobile service, the bands 6 200-6 213.5 kHz and 6 220.5-6 525 kHz may be used exceptionally by stations in the fixed service, communicating only within the boundary of the country in which they are located, with a mean power not exceeding 50 W. At the time of notification of these frequencies, the attention of the Bureau will be drawn to the above conditions.

5.138--The following bands:

6 765-6795 kHz	(centre frequency 6 780 kHz),
433.05-434.79 MHz	(centre frequency 433.92 MHz) in Region 1 except in the countries mentioned in No. **5.280)**,
61-61.5 GHz	(centre frequency 61.25 GHz),
122-123 GHz	(centre frequency 122.5 GHz), and
244-246 GHz	(centre frequency 245 GHz)

are designated for industrial, scientific and medical (ISM) applications. The use of these frequency bands for ISM applications shall be subject to special authorization by the administration concerned, in agreement with other administrations whose radiocommunication services might be affected. In applying this provision, administrations shall have due regard to the latest relevant ITU-R Recommendations.

5.138A--Until 29 March 2009, the band 6 765-7 000 kHz is allocated to the fixed service on a primary basis and to the land mobile service on a secondary basis. After this date, this band is allocated to the fixed and the mobile except aeronautical mobile (R) services on a primary basis. (WRC-03)

5.139--*Different category of service:* until 29 March 2009, in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Kazakhstan, Latvia, Lithuania, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the allocation of the band 6 765-7 000 kHz to the land mobile ser-

vice is on a primary basis (see No. **5.33**). (WRC-03)

5.140--*Additional allocation:* in Angola, Iraq, Kenya, Rwanda, Somalia and Togo, the band 7 000-7 050 kHz is also allocated to the fixed service on a primary basis. (WRC-03)

5.141--*Alternative allocation:* in Egypt, Eritrea, Ethiopia, Guinea, Libya and Madagascar, the band 7000-7050 kHz is allocated to the fixed service on a primary basis.

5.141A--*Additional allocation:* in Uzbekistan and Kyrgyzstan, the bands 7 000-7 100 kHz and 7 100-7 200 kHz are also allocated to the fixed and land mobile services on a secondary basis. (WRC-03)

5.141B--*Additional allocation:* after 29 March 2009, in Algeria, Saudi Arabia, Australia, Bahrain, Botswana, Brunei Darussalam, China, Comoros, Korea (Rep. of), Diego Garcia, Djibouti, Egypt, United Arab Emirates, Eritrea, Indonesia, Iran (Islamic Republic of), Japan, Jordan, Kuwait, Libyan Arab Jamahiriya, Morocco, Mauritania, New Zealand, Oman, Papua New Guinea, Qatar, Syrian Arab Republic, Singapore, Sudan, Tunisia, Viet Nam and Yemen, the band 7 100-7 200 kHz is also allocated to the fixed and the mobile, except aeronautical mobile (R), services on a primary basis. (WRC-03)

5.141C--In Regions 1 and 3, the band 7 100-7 200 kHz is allocated to the broadcasting service until 29 March 2009 on a primary basis. (WRC-03)

5.142--Until 29 March 2009, the use of the band 7 100-7 300 kHz in Region 2 by the amateur service shall not impose constraints on the broadcasting service intended for use within Region 1 and Region 3. After 29 March 2009 the use of the band 7 200-7 300 kHz in Region 2 by the amateur service shall not impose constraints on the broadcasting service intended for use within Region 1 and Region 3. (WRC-03)

5.143--The band 7 300-7 350 kHz is allocated, until 1 April 2007, to the fixed service on a primary basis and to the land mobile service on a secondary basis, subject to application of the procedure referred to in Resolution **21 (Rev.WRC-95)**. After 1 April 2007, frequencies in this band may be used by stations in the above-mentioned services, communicating only within the boundary of the country in which they are located, on condition that harmful interference is not caused to the broadcasting service. When using frequencies for these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations.

5.143A--In Region 3, the band 7 350-7 450 kHz is allocated, until 29 March 2009, to the fixed service on a primary basis and to the land mobile service on a secondary basis. After 29 March 2009, frequencies in this band may be used by stations in the above-mentioned services, communicating only within the boundary of the country in which they are located, on condition that harmful interference is not caused to the broadcasting service. When using frequencies for these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations. (WRC-03)

5.143B--In Region 1, the band 7 350-7 450 kHz is allocated, until 29 March 2009, to the fixed service on a primary basis and to the land mobile service on a secondary basis. After 29 March 2009, on condition that harmful interference is not caused to the broadcasting service, frequencies in the band 7 350-7 450 kHz may be used by stations in the fixed and land mobile services communicating only within the boundary of the country in which they are located, each station using a total radiated power that shall not exceed 24 dBW. (WRC-03)

5.143C--*Additional allocation:* after 29 March 2009 in Algeria, Saudi Arabia, Bahrain, Comoros, Djibouti, Egypt, United Arab Emirates, Iran (Islamic Republic of), Jordan, Kuwait, Libyan Arab Jamahiriya, Morocco, Mauritania, Oman, Qatar, Syrian Arab Republic, Sudan, Tunisia and Yemen, the bands 7 350-7 400 kHz and 7 400-7 450 kHz are also allocated to the fixed service on a primary basis. (WRC-03)

5.143D--In Region 2, the band 7 350-7 400 kHz is allocated, until 29 March 2009, to the fixed service on a primary basis and to the land mobile service on a secondary basis. After 29 March 2009, frequencies in this band may be used by stations in the above-mentioned services, communicating only within the boundary of the country in which they are located, on condition that harmful interference is not caused to the broadcasting service. When using frequencies for these services, administrations are urged to use the

minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations. (WRC-03)

5.143E--Until 29 March 2009, the band 7 450-8 100 kHz is allocated to the fixed service on a primary basis and to the land mobile service on a secondary basis. (WRC-03)

5.144--In Region 3, the stations of those services to which the band 7 995-8 005 kHz is allocated may transmit standard frequency and time signals.

5.145--The conditions for the use of the carrier frequencies 8 291 kHz, 12 290 kHz and 16 420 kHz are prescribed in Articles **31** and **52** and in Appendix **13**.

5.146--The bands 9 400-9 500 kHz, 11 600-11 650 kHz, 12 050-12 100 kHz, 15 600-15 800 kHz, 17 480-17 550 kHz and 18 900-19 020 kHz are allocated to the fixed service on a primary basis until 1 April 2007, subject to application of the procedure referred to in Resolution **21 (Rev.WRC-95)**. After 1 April 2007, frequencies in these bands may be used by stations in the fixed service, communicating only within the boundary of the country in which they are located, on condition that harmful interference is not caused to the broadcasting service. When using frequencies in the fixed service, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations.

5.147--On condition that harmful interference is not caused to the broadcasting service, frequencies in the bands 9 775-9 900 kHz, 11 650-11 700 kHz and 11 975-12 050 kHz may be used by stations in the fixed service communicating only within the boundary of the country in which they are located, each station using a total radiated power not exceeding 24 dBW.

5.148--(SUP-WRC-97)

5.149--In making assignments to stations of other services to which the bands:

13 360-13 410 kHz	25 550-25 670 kHz
37.5-38.25 MHz	73-74.6 MHz in Regions 1 and 3
150.05-153 MHz in Region 1	322-328.6 MHz
406.1-410 MHz	608-614 MHz in Regions 1 and 3
1 330-1 400 MHz	1 610.6-1 613.8 MHz
1 660-1 670 MHz	1 718.8-1 722.2 MHz
2 655-2 690 MHz	3 260-3 267 MHz
3 332-3 339 MHz	3 345.8-3 352.5 MHz
4 825-4 835 MHz	4 950-4 990 MHz
4 990-5 000 MHz	6 650-6 675.2 MHz
10.6-10.68 GHz	14.47-14.5 GHz
22.01-22.21 GHz	22.21-22.5 GHz
22.81-22.86 GHz	23.07-23.12 GHz
31.2-31.3 GHz	31.5-31.8 GHz in Regions 1 and 3
36.43-36.5 GHz	42.5-43.5 GHz
42.77-42.87 GHz	43.07-43.17 GHz
43.37-43.47 GHz	48.94-49.04 GHz
76-86 GHz	92-94 GHz
94.1-100 GHz	102-109.5 GHz
111.8-114.25 GHz	128.33-128.59 GHz
129.23-129.49 GHz	130-134 GHz
136-148.5 GHz	151.5-158.5 GHz
168.59-168.93 GHz	171.11-171.45 GHz

172.31-172.65 GHz	173.52-173.85 GHz
195.75-196.15 GHz	209-226 GHz
241-250 GHz	252-275 GHz

are allocated, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference. Emissions from spaceborne or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. **4.5** and **4.6** and Article **29**).

5.150--The following bands:

13 553-13 567 kHz	(centre frequency 13 560 kHz),
26 957-27 283 kHz	(centre frequency 27 120 kHz),
40.66-40.70 MHz	(centre frequency 40.68 MHz),
902-928 MHz in Region 2	(centre frequency 915 MHz),
2 400-2 500 MHz	(centre frequency 2 450 MHz),
5 725-5 875 MHz	(centre frequency 5 800 MHz), and
24-24.25 GHz	(centre frequency 24.125 GHz)

are also designated for industrial, scientific and medical (ISM) applications. Radiocommunication services operating within these bands must accept harmful interference which may be caused by these applications. ISM equipment operating in these bands is subject to the provisions of No. **15.13**.

5.151--The bands 13 570-13 600 kHz and 13 800-13870 kHz are allocated, until 1 April 2007, to the fixed service on a primary basis and to the mobile except aeronautical mobile (R) service on a secondary basis, subject to application of the procedure referred to in Resolution **21 (Rev.WRC-95)**. After 1 April 2007, frequencies in these bands may be used by stations in the above-mentioned services, communicating only within the boundary of the country in which they are located, on the condition that harmful interference is not caused to the broadcasting service. When using frequencies in these services, administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations.

5.152--*Additional allocation:* in Armenia, Azerbaijan, China, Côte d'Ivoire, the Russian Federation, Georgia, Iran (Islamic Republic of), Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the band 14 250-14 350 kHz is also allocated to the fixed service on a primary basis. Stations of the fixed service shall not use a radiated power exceeding 24 dBW. (WRC-03)

5.153--In Region 3, the stations of those services to which the band 15 995-16 005 kHz is allocated may transmit standard frequency and time signals.

5.154--*Additional allocation:* in Armenia, Azerbaijan, the Russian Federation, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the band 18 068-18 168 kHz is also allocated to the fixed service on a primary basis for use within their boundaries, with a peak envelope power not exceeding 1 kW. (WRC-03)

5.155--*Additional allocation:* in Armenia, Azerbaijan, Belarus, Bulgaria, the Russian Federation, Georgia, Kazakhstan, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, Slovakia, the Czech Rep., Tajikistan, Turkmenistan and Ukraine, the band 21 850-21 870 kHz is also allocated to the aeronautical mobile (R) services on a primary basis. (WRC-03)

5.155A--In Armenia, Azerbaijan, Belarus, Bulgaria, Georgia, Kazakstan, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, Slovakia, the Czech Rep., the Russian Federation, Tajikistan, Turkmenistan and Ukraine, the use of the band 21 850-21 870 kHz by the fixed service is limited to provision of services related to aircraft flight safety.

5.155B--The band 21 870-21 924 kHz is used by the fixed service for provision of services related to aircraft flight safety.

5.156--*Additional allocation:* in Nigeria, the band 22 720-23 200 kHz is also allocated to the meteorological aids service (radiosondes) on a primary basis.

5.156A--The use of the band 23 200-23 350 kHz by the fixed service is limited to provision of services

related to aircraft flight safety.

5.157--The use of the band 23 350-24 000 kHz by the maritime mobile service is limited to inter-ship radiotelegraphy.

5.160--*Additional allocation:* in Botswana, Burundi, Lesotho, Malawi, Dem. Rep. of the Congo, Rwanda and Swaziland, the band 41-44 MHz is also allocated to the aeronautical radionavigation service on a primary basis.

5.161--*Additional allocation:* in Iran (Islamic Republic of) and Japan, the band 41-44 MHz is also allocated to the radiolocation service on a secondary basis.

5.162--*Additional allocation:* in Australia and New Zealand, the band 44-47 MHz is also allocated to the broadcasting service on a primary basis.

5.162A--*Additional allocation:* in Germany, Austria, Belgium, Bosnia and Herzegovina, China, Vatican, Denmark, Spain, Estonia, Finland, France, Ireland, Iceland, Italy, Latvia, The Former Yugoslav Republic of Macedonia, Liechtenstein, Lithuania, Luxembourg, Moldova, Monaco, Norway, the Netherlands, Poland, Portugal, Slovakia, the Czech Rep., the United Kingdom, the Russian Federation, Sweden and Switzerland the band 46-68 MHz is also allocated to the radiolocation service on a secondary basis. This use is limited to the operation of wind profiler radars in accordance with Resolution **217 (WRC-97)**.

5.163--*Additional allocation:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Hungary, Kazakhstan, Latvia, Lithuania, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, Slovakia, the Czech Rep., Tajikistan, Turkmenistan and Ukraine, the bands 47-48.5 MHz and 56.5-58 MHz are also allocated to the fixed and land mobile services on a secondary basis. (WRC-03)

5.164--*Additional allocation:* in Albania, Germany, Austria, Belgium, Bosnia and Herzegovina, Botswana, Bulgaria, Côte d'Ivoire, Denmark, Spain, Estonia, Finland, France, Gabon, Greece, Ireland, Israel, Italy, Jordan, Lebanon, Libyan Arab Jamahiriya, Liechtenstein, Luxembourg, Madagascar, Mali, Malta, Morocco, Mauritania, Monaco, Nigeria, Norway, the Netherlands, Poland, Syrian Arab Republic, the United Kingdom, Serbia and Montenegro, Slovenia, Sweden, Switzerland, Swaziland, Chad, Togo, Tunisia and Turkey, the band 47-68 MHz, in Romania the band 47-58 MHz, in South Africa the band 47-50 MHz, and in the Czech Rep. the band 66-68 MHz, are also allocated to the land mobile service on a primary basis. However, stations of the land mobile service in the countries mentioned in connection with each band referred to in this footnote shall not cause harmful interference to, or claim protection from, existing or planned broadcasting stations of countries other than those mentioned in connection with the band. (WRC-03)

5.165--*Additional allocation:* in Angola, Cameroon, the Congo, Madagascar, Mozambique, Somalia, Sudan, Tanzania and Chad, the band 47-68 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

5.166--*Alternative allocation:* in New Zealand, the band 50-51 MHz is allocated to the fixed, mobile and broadcasting services on a primary basis; the band 53-54 MHz is allocated to the fixed and mobile services on a primary basis.

5.167--*Alternative allocation:* in Bangladesh, Brunei Darussalam, India, Indonesia, Iran (Islamic Republic of), Malaysia, Pakistan, Singapore and Thailand, the band 50-54 MHz is allocated to the fixed, mobile and broadcasting services on a primary basis.

5.168--*Additional allocation:* in Australia, China and the Dem. People's Rep. of Korea, the band 50-54 MHz is also allocated to the broadcasting service on a primary basis.

5.169--*Alternative allocation:* in Botswana, Burundi, Lesotho, Malawi, Namibia, Dem. Rep. of the Congo, Rwanda, South Africa, Swaziland, Zambia and Zimbabwe, the band 50-54 MHz is allocated to the amateur service on a primary basis.

5.170--*Additional allocation:* in New Zealand, the band 51-53 MHz is also allocated to the fixed and mobile services on a primary basis.

5.171--*Additional allocation:* in Botswana, Burundi, Lesotho, Malawi, Mali, Namibia, Dem. Rep. of the Congo, Rwanda, South Africa, Swaziland and Zimbabwe, the band 54-68 MHz is also allocated to the

fixed and mobile, except aeronautical mobile, services on a primary basis.

5.172--*Different category of service:* in the French Overseas Departments in Region 2, Guyana, Jamaica and Mexico, the allocation of the band 54-68 MHz to the fixed and mobile services is on a primary basis (see No. **5.33**).

5.173--*Different category of service:* in the French Overseas Departments in Region 2, Guyana, Jamaica and Mexico, the allocation of the band 68-72 MHz to the fixed and mobile services is on a primary basis (see No. **5.33**).

5.174--*Alternative allocation:* in Bulgaria, Hungary and Romania, the band 68-73 MHz is allocated to the broadcasting service on a primary basis and used in accordance with the decisions in the Final Acts of the Special Regional Conference (Geneva, 1960). (WRC-03)

5.175--*Alternative allocation:* in Armenia, Azerbaijan, Belarus, Georgia, Kazakstan, Latvia, Lithuania, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, the Russian Federation, Tajikistan, Turkmenistan and Ukraine, the bands 68-73 MHz and 76-87.5 MHz are allocated to the broadcasting service on a primary basis. The services to which these bands are allocated in other countries and the broadcasting service in the countries listed above are subject to agreements with the neighbouring countries concerned.

5.176--*Additional allocation:* in Australia, China, Korea (Rep. of), Estonia (subject to agreement obtained under No. **9.21**), the Philippines, the Dem. People's Rep. of Korea and Samoa, the band 68-74 MHz is also allocated to the broadcasting service on a primary basis.

5.177--*Additional allocation:* in Armenia, Azerbaijan, Belarus, Bulgaria, the Russian Federation, Georgia, Kazakhstan, Latvia, Moldova, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the band 73-74 MHz is also allocated to the broadcasting service on a primary basis, subject to agreement obtained under No. **9.21**. (WRC-03)

5.178--*Additional allocation:* in Colombia, Costa Rica, Cuba, El Salvador, Guatemala, Guyana, Honduras and Nicaragua, the band 73-74.6 MHz is also allocated to the fixed and mobile services on a secondary basis.

5.179--*Additional allocation:* in Armenia, Azerbaijan, Belarus, Bulgaria, China, the Russian Federation, Georgia, Kazakhstan, Lithuania, Moldova, Mongolia, Kyrgyzstan, Slovakia, Tajikistan, Turkmenistan and Ukraine, the bands 74.6-74.8 MHz and 75.2-75.4 MHz are also allocated to the aeronautical radionavigation service, on a primary basis, for ground-based transmitters only. (WRC-03)

5.180--The frequency 75 MHz is assigned to marker beacons. Administrations shall refrain from assigning frequencies close to the limits of the guardband to stations of other services which, because of their power or geographical position, might cause harmful interference or otherwise place a constraint on marker beacons.

Every effort should be made to improve further the characteristics of airborne receivers and to limit the power of transmitting stations close to the limits 74.8 MHz and 75.2 MHz.

5.181--*Additional allocation:* in Egypt, Israel and Syrian Arab Republic, the band 74.8-75.2 MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No. **9.21**. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedure invoked under No. **9.21**. (WRC-03)

5.182--*Additional allocation:* in Western Samoa, the band 75.4-87 MHz is also allocated to the broadcasting service on a primary basis.

5.183--*Additional allocation:* in China, Korea (Rep. of), Japan, the Philippines and the Dem. People's Rep. of Korea, the band 76-87 MHz is also allocated to the broadcasting service on a primary basis.

5.184--*Additional allocation:* in Bulgaria and Romania, the band 76-87.5 MHz is also allocated to the broadcasting service on a primary basis and used in accordance with the decisions contained in the Final Acts of the Special Regional Conference (Geneva, 1960).

5.185--*Different category of service:* in the United States, the French Overseas Departments in Region 2,

Guyana, Jamaica, Mexico and Paraguay, the allocation of the band 76-88 MHz to the fixed and mobile services is on a primary basis (see No. **5.33**).

5.187--*Alternative allocation:* in Albania, the band 81-87.5 MHz is allocated to the broadcasting service on a primary basis and used in accordance with the decisions contained in the Final Acts of the Special Regional Conference (Geneva, 1960).

5.188--*Additional allocation:* in Australia, the band 85-87 MHz is also allocated to the broadcasting service on a primary basis. The introduction of the broadcasting service in Australia is subject to special agreements between the administrations concerned.

5.190--*Additional allocation:* in Monaco, the band 87.5-88 MHz is also allocated to the land mobile service on a primary basis, subject to agreement obtained under No. **9.21**.

5.192--*Additional allocation:* in China and Korea (Rep. of), the band 100-108 MHz is also allocated to the fixed and mobile services on a primary basis.

5.194--*Additional allocation:* in Azerbaijan, Lebanon, Syria, Kyrgyzstan, Somalia and Turkmenistan, the band 104-108 MHz is also allocated to the mobile, except aeronautical mobile (R), service on a secondary basis.

5.197--*Additional allocation:* in Japan, Pakistan and Syria, the band 108-111.975 MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No. **9.21**. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedures invoked under No. **9.21**.

5.197A--The band 108-117.975 MHz may also be used by the aeronautical mobile (R) service on a primary basis, limited to systems that transmit navigational information in support of air navigation and surveillance functions in accordance with recognized international aviation standards. Such use shall be in accordance with Resolution **413 (WRC-03)** and shall not cause harmful interference to nor claim protection from stations operating in the aeronautical radionavigation service which operate in accordance with international aeronautical standards. (WRC-03)

5.198--*Additional allocation:* the band 117.975-136 MHz is also allocated to the aeronautical mobile-satellite (R) service on a secondary basis, subject to agreement obtained under No. **9.21**.

5.199--The bands 121.45-121.55 MHz and 242.95-243.05 MHz are also allocated to the mobile-satellite service for the reception on board satellites of emissions from emergency position-indicating radiobeacons transmitting at 121.5 MHz and 243 MHz (see Appendix **13**).

5.200--In the band 117.975-136 MHz, the frequency 121.5 MHz is the aeronautical emergency frequency and, where required, the frequency 123.1 MHz is the aeronautical frequency auxiliary to 121.5 MHz. Mobile stations of the maritime mobile service may communicate on these frequencies under the conditions laid down in Article **31** and Appendix **13** for distress and safety purposes with stations of the aeronautical mobile service.

5.201--*Additional allocation:* in Angola, Armenia, Azerbaijan, Belarus, Bulgaria, Estonia, Georgia, Hungary, Iran (Islamic Republic of), Iraq, Japan, Kazakstan, Latvia, Moldova, Mongolia, Mozambique, Uzbekistan, Papua New Guinea, Poland, Kyrgyzstan, Slovakia, the Czech Rep., Romania, Russian Federation, Tajikistan, Turkmenistan and Ukraine, the band 132-136 MHz is also allocated to the aeronautical mobile (OR) service on a primary basis. In assigning frequencies to stations of the aeronautical mobile (OR) service, the administration shall take account of the frequencies assigned to stations in the aeronautical mobile (R) service.

5.202--*Additional allocation:* in Saudi Arabia, Armenia, Azerbaijan, Belarus, Bulgaria, the United Arab Emirates, Georgia, Iran (Islamic Republic of), Jordan, Latvia, Moldova, Oman, Uzbekistan, Poland, Syria, Kyrgyzstan, Slovakia, the Czech Rep., Romania, the Russian Federation, Tajikistan, Turkmenistan and Ukraine, the band 136-137 MHz is also allocated to the aeronautical mobile (OR) service on a primary basis. In assigning frequencies to stations of the aeronautical mobile (OR) service, the adminis-

tration shall take account of the frequencies assigned to stations in the aeronautical mobile (R) service.

5.203--In the band 136-137 MHz, existing operational meteorological satellites may continue to operate, under the conditions defined in No. **4.4** with respect to the aeronautical mobile service, until 1 January 2002. Administrations shall not authorize new frequency assignments in this band to stations in the meteorological-satellite service.

5.203A--*Additional allocation:* in Israel, Mauritania, Qatar and Zimbabwe, the band 136-137 MHz is also allocated to the fixed and mobile, except aeronautical mobile (R), services on a secondary basis until 1 January 2005.

5.203B--*Additional allocation:* in Saudi Arabia, United Arab Emirates, Oman and Syrian Arab Republic, the band 136-137 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis until 1 January 2005. (WRC-03)

5.204--*Different category of service:* in Afghanistan, Saudi Arabia, Bahrain, Bangladesh, Bosnia and Herzegovina, Brunei Darussalam, China, Cuba, the United Arab Emirates, India, Indonesia, Iran (Islamic Republic of), Iraq, Malaysia, Oman, Pakistan, Philippines, Qatar, Serbia and Montenegro, Singapore, Thailand and Yemen, the band 137-138 MHz is allocated to the fixed and mobile, except aeronautical mobile (R), services on a primary basis (see No. **5.33**). (WRC-03)

5.205--*Different category of service:* in Israel and Jordan, the allocation of the band 137-138 MHz to the fixed and mobile, except aeronautical mobile, services is on a primary basis (see No. **5.33**).

5.206--*Different category of service:* in Armenia, Azerbaijan, Belarus, Bulgaria, Egypt, Finland, France, Georgia, Greece, Kazakstan, Lebanon, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Syria, Slovakia, the Czech Rep., Romania, the Russian Federation, Tajikistan, Turkmenistan and Ukraine, the allocation of the band 137-138 MHz to the aeronautical mobile (OR) service is on a primary basis (see No. **5.33**).

5.207--*Additional allocation:* in Australia, the band 137-144 MHz is also allocated to the broadcasting service on a primary basis until that service can be accommodated within regional broadcasting allocations.

5.208--The use of the band 137-138 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**.

5.208A--In making assignments to space stations in the mobile-satellite service in the bands 137-138 MHz, 387-390 MHz and 400.15-401 MHz, administrations shall take all practicable steps to protect the radio astronomy service in the bands 150.05-153 MHz, 322-328.6 MHz, 406.1-410 MHz and 608-614 MHz from harmful interference from unwanted emissions. The threshold levels of interference detrimental to the radio astronomy service are shown in Table 1 of Recommendation ITU-R RA.769-1.

5.209--The use of the bands 137-138 MHz, 148-150.05 MHz, 399.9-400.05 MHz, 400.15-401 MHz, 454-456 MHz and 459-460 MHz by the mobile-satellite service is limited to non-geostationary-satellite systems.

5.210--*Additional allocation:* in France, Italy, the Czech Rep. and the United Kingdom, the bands 138-143.6 MHz and 143.65-144 MHz are also allocated to the space research service (space-to-Earth) on a secondary basis. (WRC-03)

5.211--*Additional allocation:* in Germany, Saudi Arabia, Austria, Bahrain, Belgium, Bosnia and Herzegovina, Denmark, the United Arab Emirates, Spain, Finland, Greece, Ireland, Israel, Kenya, Kuwait, The Former Yugoslav Republic of Macedonia, Liechtenstein, Luxembourg, Mali, Malta, Norway, the Netherlands, Qatar, the United Kingdom, Somalia, Sweden, Switzerland, Tanzania, Tunisia, Turkey and Yugoslavia, the band 138-144 MHz is also allocated to the maritime mobile and land mobile services on a primary basis.

5.212--*Alternative allocation:* in Angola, Botswana, Burundi, Cameroon, the Central African Rep., Congo (Rep. of the), Gabon, Gambia, Ghana, Guinea, Iraq, Jordan, Lesotho, Liberia, Libyan Arab Jamahiriya, Malawi, Mozambique, Namibia, Oman, Uganda, Dem. Rep. of the Congo, Rwanda, Sierra Leone, South Africa, Swaziland, Chad, Togo, Zambia and Zimbabwe, the band 138 144 MHz is allo-

cated to the fixed and mobile services on a primary basis. (WRC-03)

5.213--*Additional allocation:* in China, the band 138-144 MHz is also allocated to the radiolocation service on a primary basis.

5.214--*Additional allocation:* in Bosnia and Herzegovina, Croatia, Eritrea, Ethiopia, Kenya, The Former Yugoslav Republic of Macedonia, Malta, Somalia, Sudan, Tanzania and Yugoslavia, the band 138-144 MHz is also allocated to the fixed service on a primary basis.

5.216--*Additional allocation:* in China, the band 144-146 MHz is also allocated to the aeronautical mobile (OR) service on a secondary basis.

5.217--*Alternative allocation:* in Afghanistan, Bangladesh, Cuba, Guyana and India, the band 146-148 MHz is allocated to the fixed and mobile services on a primary basis.

5.218--*Additional allocation:* the band 148-149.9 MHz is also allocated to the space operation service (Earth-to-space) on a primary basis, subject to agreement obtained under No. **9.21**. The bandwidth of any individual transmission shall not exceed $\pm$ 25 kHz.

5.219--The use of the band 148-149.9 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**. The mobile-satellite service shall not constrain the development and use of the fixed, mobile and space operation services in the band 148-149.9 MHz.

5.220--The use of the bands 149.9-150.05 MHz and 399.9-400.05 MHz by the mobile-satellite service is subject to coordination under No. 9.11A. The mobile-satellite service shall not constrain the development and use of the radionavigation-satellite service in the bands 149.9-150.05 MHz and 399.9-400.05 MHz.

5.221--Stations of the mobile-satellite service in the band 148-149.9 MHz shall not cause harmful interference to, or claim protection from, stations of the fixed or mobile services operating in accordance with the Table of Frequency Allocations in the following countries: Albania, Algeria, Germany, Saudi Arabia, Australia, Austria, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Benin, Bosnia and Herzegovina, Botswana, Brunei Darussalam, Bulgaria, Cameroon, China, Cyprus, Congo (Rep. of the), Korea (Rep. of), Côte d'Ivoire, Croatia, Cuba, Denmark, Egypt, the United Arab Emirates, Eritrea, Spain, Estonia, Ethiopia, the Russian Federation, Finland, France, Gabon, Ghana, Greece, Guinea, Guinea Bissau, Hungary, India, Iran (Islamic Republic of), Ireland, Iceland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kuwait, The Former Yugoslav Republic of Macedonia, Lesotho, Latvia, Lebanon, Libyan Arab Jamahiriya, Liechtenstein, Lithuania, Luxembourg, Malaysia, Mali, Malta, Mauritania, Moldova, Mongolia, Mozambique, Namibia, Norway, New Zealand, Oman, Uganda, Uzbekistan, Pakistan, Panama, Papua New Guinea, Paraguay, the Netherlands, the Philippines, Poland, Portugal, Qatar, Syrian Arab Republic, Kyrgyzstan, Slovakia, Romania, the United Kingdom, Senegal, Serbia and Montenegro, Sierra Leone, Singapore, Slovenia, Sri Lanka, South Africa, Sweden, Switzerland, Swaziland, Tanzania, Chad, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Ukraine, Viet Nam, Yemen, Zambia, and Zimbabwe. (WRC-03)

5.222--Emissions of the radionavigation-satellite service in the bands 149.9-150.05 MHz and 399.9-400.05 MHz may also be used by receiving earth stations of the space research service.

5.223--Recognizing that the use of the band 149.9-150.05 MHz by the fixed and mobile services may cause harmful interference to the radionavigation-satellite service, administrations are urged not to authorize such use in application of No. **4.4**.

5.224A--The use of the bands 149.9-150.05 MHz and 399.9-400.05 MHz by the mobile-satellite service (Earth-to-space) is limited to the land mobile-satellite service (Earth-to-space) until 1 January 2015.

5.224B--The allocation of the bands 149.9-150.05 MHz and 399.9-400.05 MHz to the radionavigation-satellite service shall be effective until 1 January 2015.

5.225--*Additional allocation:* in Australia and India, the band 150.05-153 MHz is also allocated to the radio astronomy service on a primary basis.

5.226--The frequency 156.8 MHz is the international distress, safety and calling frequency for the maritime mobile VHF radiotelephone service. The conditions for the use of this frequency are contained in Article **31** and Appendix **13**.

In the bands 156-156.7625 MHz, 156.8375-157.45 MHz, 160.6-160.975 MHz and 161.475-162.05 MHz, each administration shall give priority to the maritime mobile service on only such frequencies as are assigned to stations of the maritime mobile service by the administration (see Articles **31** and **52**, and Appendix **13**).

Any use of frequencies in these bands by stations of other services to which they are allocated should be avoided in areas where such use might cause harmful interference to the maritime mobile VHF radiocommunication service.

However, the frequency 156.8 MHz and the frequency bands in which priority is given to the maritime mobile service may be used for radiocommunications on inland waterways subject to agreement between interested and affected administrations and taking into account current frequency usage and existing agreements.

5.227--In the maritime mobile VHF service the frequency 156.525 MHz is to be used exclusively for digital selective calling for distress, safety and calling. The conditions for the use of this frequency are prescribed in Articles **31** and **52**, and Appendices **13** and **18**.

5.229--*Alternative allocation:* in Morocco, the band 162-174 MHz is allocated to the broadcasting service on a primary basis. The use of this band shall be subject to agreement with administrations having services, operating or planned, in accordance with the Table which are likely to be affected. Stations in existence on 1 January 1981, with their technical characteristics as of that date, are not affected by such agreement.

5.230--*Additional allocation:* in China, the band 163-167 MHz is also allocated to the space operation service (space-to-Earth) on a primary basis, subject to agreement obtained under No. **9.21**.

5.231--*Additional allocation:* in Afghanistan, China and Pakistan, the band 167-174 MHz is also allocated to the broadcasting service on a primary basis. The introduction of the broadcasting service into this band shall be subject to agreement with the neighbouring countries in Region 3 whose services are likely to be affected.

5.232--*Additional allocation:* in Japan, the band 170-174 MHz is also allocated to the broadcasting service on a primary basis.

5.233--*Additional allocation:* in China, the band 174-184 MHz is also allocated to the space research (space-to-Earth) and the space operation (space-to-Earth) services on a primary basis, subject to agreement obtained under No. **9.21**. These services shall not cause harmful interference to, or claim protection from, existing or planned broadcasting stations.

5.234--*Different category of service:* in Mexico, the allocation of the band 174-216 MHz to the fixed and mobile services is on a primary basis (see No. **5.33**).

5.235--*Additional allocation:* in Germany, Austria, Belgium, Denmark, Spain, Finland, France, Israel, Italy, Liechtenstein, Malta, Monaco, Norway, the Netherlands, the United Kingdom, Sweden and Switzerland, the band 174-223 MHz is also allocated to the land mobile service on a primary basis. However, the stations of the land mobile service shall not cause harmful interference to, or claim protection from, broadcasting stations, existing or planned, in countries other than those listed in this footnote.

5.237--*Additional allocation:* in Congo (Rep. of the), Eritrea, Ethiopia, Gambia, Guinea, Libyan Arab Jamahiriya, Malawi, Mali, Sierra Leone, Somali, Chad and Zimbabwe, the band 174-223 MHz is also allocated to the fixed and mobile services on a secondary basis. (WRC-03)

5.238--*Additional allocation:* in Bangladesh, India, Pakistan and the Philippines, the band 200-216 MHz is also allocated to the aeronautical radionavigation service on a primary basis.

5.240--*Additional allocation:* in China and India, the band 216-223 MHz is also allocated to the aeronautical radionavigation service on a primary basis and to the radiolocation service on a secondary basis.

5.241--In Region 2, no new stations in the radiolocation service may be authorized in the band 216-225 MHz. Stations authorized prior to 1 January 1990 may continue to operate on a secondary basis.

5.242--*Additional allocation:* in Canada, the band 216-220 MHz is also allocated to the land mobile service on a primary basis.

5.243--*Additional allocation:* in Somalia, the band 216-225 MHz is also allocated to the aeronautical radionavigation service on a primary basis, subject to not causing harmful interference to existing or planned broadcasting services in other countries.
5.245--*Additional allocation:* in Japan, the band 222-223 MHz is also allocated to the aeronautical radionavigation service on a primary basis and to the radiolocation service on a secondary basis.
5.246--*Alternative allocation:* in Spain, France, Israel and Monaco, the band 223-230 MHz is allocated to the broadcasting and land mobile services on a primary basis (see No. **5.33**) on the basis that, in the preparation of frequency plans, the broadcasting service shall have prior choice of frequencies; and allocated to the fixed and mobile, except land mobile, services on a secondary basis. However, the stations of the land mobile service shall not cause harmful interference to, or claim protection from, existing or planned broadcasting stations in Morocco and Algeria.
5.247--*Additional allocation:* in Saudi Arabia, Bahrain, the United Arab Emirates, Jordan, Oman, Qatar and Syria, the band 223-235 MHz is also allocated to the aeronautical radionavigation service on a primary basis.
5.250--*Additional allocation:* in China, the band 225-235 MHz is also allocated to the radio astronomy service on a secondary basis.
5.251--*Additional allocation:* in Nigeria, the band 230-235 MHz is also allocated to the aeronautical radionavigation service on a primary basis, subject to agreement obtained under No. **9.21**.
5.252--*Alternative allocation:* in Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe, the bands 230-238 MHz and 246-254 MHz are allocated to the broadcasting service on a primary basis, subject to agreement obtained under No. **9.21**.
5.254--The bands 235-322 MHz and 335.4-399.9 MHz may be used by the mobile-satellite service, subject to agreement obtained under No. **9.21**, on condition that stations in this service do not cause harmful interference to those of other services operating or planned to be operated in accordance with the Table of Frequency Allocations except for the additional allocation made in footnote No. **5.256A**. (WRC-03)
5.255--The bands 312-315 MHz (Earth-to-space) and 387-390 MHz (space-to-Earth) in the mobile-satellite service may also be used by non-geostationary-satellite systems. Such use is subject to coordination under No. **9.11A**.
5.256--The frequency 243 MHz is the frequency in this band for use by survival craft stations and equipment used for survival purposes (see Appendix **13**).
5.256A--*Additional allocation:* in China, the Russian Federation, Kazakhstan and Ukraine, the band 258-261 MHz is also allocated to the space research service (Earth-to-space) and space operation service (Earth-to-space) on a primary basis. Stations in the space research service (Earth-to-space) and space operation service (Earth-to-space) shall not cause harmful interference to, nor claim protection from, nor constrain the use and development of the mobile service systems and mobile-satellite service systems operating in the band. Stations in space research service (Earth-to-space) and space operation service (Earth-to-space) shall not constrain the future development of fixed service systems of other countries. (WRC-03)
5.258--The use of the band 328.6-335.4 MHz by the aeronautical radionavigation service is limited to Instrument Landing Systems (glide path).
5.259--*Additional allocation:* in Egypt, Israel, Japan, and Syria, the band 328.6-335.4 MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No. **9.21**. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedure invoked under No. **9.21**.
5.260--Recognizing that the use of the band 399.9-400.05 MHz by the fixed and mobile services may cause harmful interference to the radionavigation satellite service, administrations are urged not to authorize such use in application of No. **4.4**.

5.261--Emissions shall be confined in a band of ± 25 kHz about the standard frequency 400.1 MHz.
5.262--*Additional allocation:* : in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Bosnia and Herzegovina, Botswana, Bulgaria, Colombia, Costa Rica, Cuba, Egypt, the United Arab Emirates, Ecuador, the Russian Federation, Georgia, Hungary, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kazakhstan, Kuwait, Liberia, Malaysia, Moldova, Uzbekistan, Pakistan, the Philippines, Qatar, Syrian Arab Republic, Kyrgyzstan, Romania, Serbia and Montenegro, Singapore, Somalia, Tajikistan, Turkmenistan and Ukraine, the band 400.05-401 MHz is also allocated to the fixed and mobile services on a primary (WRC-03)
5.263--The band 400.15-401 MHz is also allocated to the space research service in the space-to-space direction for communications with manned space vehicles. In this application, the space research service will not be regarded as a safety service.
5.264--The use of the band 400.15-401 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**. The power flux-density limit indicated in Annex 1 of Appendix **5** shall apply until such time as a competent world radiocommunication conference revises it.
5.266--The use of the band 406-406.1 MHz by the mobile-satellite service is limited to low power satellite emergency position-indicating radiobeacons (see also Article **31** and Appendix **13**).
5.267--Any emission capable of causing harmful interference to the authorized uses of the band 406-406.1 MHz is prohibited.
5.268--Use of the band 410-420 MHz by the space research service is limited to communications within 5 km of an orbiting, manned space vehicle. The power flux-density at the surface of the Earth produced by emissions from extra-vehicular activities shall not exceed -153 dB(W/m²) for $0° \le \delta \le 5°$, $-153 + 0.077\ (\delta - 5)$ dB(W/m²) for $5° \le \delta \le 70°$ and -148 dB(W/m²) for $70° \le \delta \le 90°$, where δ is the angle of arrival of the radio-frequency wave and the reference bandwidth is 4 kHz. No. **4.10** does not apply to extra-vehicular activities. In this frequency band the space research (space-to-space) service shall not claim protection from, nor constrain the use and development of, stations of the fixed and mobile services.
5.269--*Different category of service:* in Australia, the United States, India, Japan and the United Kingdom, the allocation of the bands 420-430 MHz and 440-450 MHz to the radiolocation service is on a primary basis (see No. **5.33**).
5.270--*Additional allocation:* in Australia, the United States, Jamaica and the Philippines, the bands 420-430 MHz and 440-450 MHz are also allocated to the amateur service on a secondary basis.
5.271--*Additional allocation:* in Azerbaijan, Belarus, China, India, Latvia, Lithuania, Kyrgyzstan and Turkmenistan, the band 420-460 MHz is also allocated to the aeronautical radionavigation service (radio altimeters) on a secondary basis. (WRC-03)
5.272--*Different category of service:* in France, the allocation of the band 430-434 MHz to the amateur service is on a secondary basis (see No. **5.32**).
5.273--*Different category of service:* in Libyan Arab Jamahiriya, the allocation of the bands 430-432 MHz and 438-440 MHz to the radiolocation service is on a secondary basis (see No. **5.32**). (WRC-03)
5.274--*Alternative allocation:* in Denmark, Norway and Sweden, the bands 430-432 MHz and 438-440 MHz are allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.
5.275--*Additional allocation:* in Bosnia and Herzegovina, Croatia, Estonia, Finland, Latvia, The Former Yugoslav Republic of Macedonia, Libya, Slovenia and Yugoslavia, the bands 430-432 MHz and 438-440 MHz are also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.
5.276--*Additional allocation:* in Afghanistan, Algeria, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Burkina Faso, Burundi, Egypt, the United Arab Emirates, Ecuador, Eritrea, Ethiopia, Greece, Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Italy, Jordan, Kenya, Kuwait, Lebanon, Libya, Liechtenstein, Malaysia, Malta, Nigeria, Oman, Pakistan, the Philippines, Qatar, Syria, the Dem. People's Rep. of Korea, Singapore, Somalia, Switzerland, Tanzania, Thailand, Togo, Turkey and Yemen, the band 430-440 MHz is also allocated to the fixed service on a primary basis and the bands

430-435 MHz and 438-440 MHz are also allocated to the mobile, except aeronautical mobile, service on a primary basis.

5.277--*Additional allocation:* in Angola, Armenia, Azerbaijan, Belarus, Cameroon, Congo (Rep. of the), Djibouti, the Russian Federation, Georgia, Hungary, Israel, Kazakhstan, Mali, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Rep., Romania, Rwanda, Tajikistan, Chad, Turkmenistan and Ukraine, the band 430-440 MHz is also allocated to the fixed service on a primary basis. (WRC-03)

5.278--*Different category of service:* in Argentina, Colombia, Costa Rica, Cuba, Guyana, Honduras, Panama and Venezuela, the allocation of the band 430-440 MHz to the amateur service is on a primary basis (see No. **5.33**).

5.279--*Additional allocation:* in Mexico, the bands 430-435 MHz and 438-440 MHz are also allocated on a primary basis to the land mobile service, subject to agreement obtained under No. **9.21**.

5.279A--The use of this band by sensors in the Earth exploration-satellite service (active) shall be in accordance with Recommendation ITU R SA.1260 1. Additionally, the Earth exploration-satellite service (active) in the band 432-438 MHz shall not cause harmful interference to the aeronautical radionavigation service in China.

The provisions of this footnote in no way diminish the obligation of the Earth exploration-satellite service (active) to operate as a secondary service in accordance with Nos. **5.29** and **5.30** (WRC-03)

5.280--In Germany, Austria, Bosnia and Herzegovina, Croatia, The Former Yugoslav Republic of Macedonia, Liechtenstein, Portugal, Slovenia, Switzerland and Yugoslavia, the band 433.05-434.79 MHz (centre frequency 433.92 MHz) is designated for industrial, scientific and medical (ISM) applications. Radiocommunication services of these countries operating within this band must accept harmful interference which may be caused by these applications. ISM equipment operating in this band is subject to the provisions of No. **15.13**.

5.281--*Additional allocation:* in the French Overseas Departments in Region 2 and India, the band 433.75-434.25 MHz is also allocated to the space operation service (Earth-to-space) on a primary basis. In France and in Brazil, the band is allocated to the same service on a secondary basis.

5.282--In the bands 435-438 MHz, 1 260-1 270 MHz, 2 400-2 450 MHz, 3 400-3 410 MHz (in Regions 2 and 3 only) and 5650-5670 MHz, the amateur-satellite service may operate subject to not causing harmful interference to other services operating in accordance with the Table (see No. **5.43**). Administrations authorizing such use shall ensure that any harmful interference caused by emissions from a station in the amateur-satellite service is immediately eliminated in accordance with the provisions of No. **25.11**. The use of the bands 1 260-1 270 MHz and 5 650-5 670 MHz by the amateur-satellite service is limited to the Earth-to-space direction.

5.283--*Additional allocation:* in Austria, the band 438-440 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

5.284--*Additional allocation:* in Canada, the band 440-450 MHz is also allocated to the amateur service on a secondary basis.

5.285--*Different category of service:* in Canada, the allocation of the band 440-450 MHz to the radiolocation service is on a primary basis (see No. **5.33**).

5.286--The band 449.75-450.25 MHz may be used for the space operation service (Earth-to-space) and the space research service (Earth-to-space), subject to agreement obtained under No. **9.21**.

5.286A--The use of the bands 454-456 MHz and 459-460 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**.

5.286B--The use of the band 454-455 MHz in the countries listed in No. **5.286D**, 455-456 MHz and 459-460 MHz in Region 2, and 454-456 MHz and 459-460 MHz in the countries listed in No. **5.286E**, by stations in the mobile-satellite service, shall not cause harmful interference to, or claim protection from, stations of the fixed or mobile services operating in accordance with the Table of Frequency Allocations.

5.286C--The use of the band 454-455 MHz in the countries listed in No. **5.286D**, 455-456 MHz and 459-

460 MHz in Region 2, and 454-456 MHz and 459-460 MHz in the countries listed in No. **5.286E**, by stations in the mobile-satellite service, shall not constrain the development and use of the fixed and mobile services operating in accordance with the Table of Frequency Allocations.

5.286D--*Additional allocation:* in Canada, the United States, Mexico and Panama, the band 454-455 MHz is also allocated to the mobile-satellite service (Earth-to-space) on a primary basis.

5.286E--*Additional allocation:* in Cape Verde, Indonesia, Nepal, Nigeria and Papua New Guinea, the bands 454-456 MHz and 459-460 MHz are also allocated to the mobile-satellite (Earth-to-space) service on a primary basis.

5.287--In the maritime mobile service, the frequencies 457.525 MHz, 457.550 MHz, 457.575 MHz, 467.525 MHz, 467.550 MHz and 467.575 MHz may be used by on-board communication stations. Where needed, equipment designed for 12.5 kHz channel spacing using also the additional frequencies 457.5375 MHz, 457.5625 MHz, 467.5375 MHz and 467.5625 MHz may be introduced for on-board communications. The use of these frequencies in territorial waters may be subject to the national regulations of the administration concerned. The characteristics of the equipment used shall conform to those specified in Recommendation ITU-R M.1174 (see Resolution **341 (WRC-97)**).

5.288--In the territorial waters of the United States and the Philippines, the preferred frequencies for use by on-board communication stations shall be 457.525 MHz, 457.550 MHz, 457.575 MHz and 457.600 MHz paired, respectively, with 467.750 MHz, 467.775 MHz, 467.800 MHz and 467.825 MHz. The characteristics of the equipment used shall conform to those specified in Recommendation ITU-R M.1174-1. (WRC-03)

5.289--Earth exploration-satellite service applications, other than the meteorological-satellite service, may also be used in the bands 460-470 MHz and 1690-1710 MHz for space-to-Earth transmissions subject to not causing harmful interference to stations operating in accordance with the Table.

5.290--*Different category of service:* in Afghanistan, Azerbaijan, Belarus, China, Japan, Mongolia, Uzbekistan, Kyrgyzstan, Slovakia, the Russian Federation, Tajikistan, Turkmenistan and Ukraine, the allocation of the band 460-470 MHz to the meteorological-satellite service (space-to-Earth) is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21**.

5.291--*Additional allocation:* in China, the band 470-485 MHz is also allocated to the space research (space-to-Earth) and the space operation (space-to-Earth) services on a primary basis subject to agreement obtained under No. **9.21** and subject to not causing harmful interference to existing and planned broadcasting stations.

5.291A--*Additional allocation:* in Germany, Austria, Denmark, Estonia, Finland, Liechtenstein, Norway, Netherlands, the Czech Rep. and Switzerland, the band 470-494 MHz is also allocated to the radiolocation service on a secondary basis. This use is limited to the operation of wind profiler radars in accordance with Resolution **217 (WRC-97)**.

5.292--*Different category of service:* in Mexico and Venezuela, the allocation of the band 470-512 MHz to the fixed and mobile services, and in Argentina and Uruguay to the mobile service, is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21**.

5.293--*Different category of service:* in Canada, Chile, Colombia, Cuba, the United States, Guyana, Honduras, Jamaica, Mexico, Panama and Peru, the allocation of the bands 470-512 MHz and 614-806 MHz to the fixed and mobile services is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21**. In Argentina and Ecuador, the allocation of the band 470-512 MHz to the fixed and mobile services is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21**.

5.294--*Additional allocation:* in Burundi, Cameroon, Congo (Rep. of the), Côte d'Ivoire, Ethiopia, Israel, Kenya, Lebanon, Libyan Arab Jamahiriya, Malawi, Syrian Arab Republic, Sudan, Chad and Yemen, the band 470-582 MHz is also allocated to the fixed service on a secondary basis. (WRC-03)

5.296--*Additional allocation:* in Germany, Austria, Belgium, Côte d'Ivoire, Denmark, Spain, Finland, France, Ireland, Israel, Italy, Libyan Arab Jamahiriya, Lithuania, Malta, Morocco, Monaco, Norway, the Netherlands, Portugal, Syrian Arab Republic, the United Kingdom, Sweden, Switzerland, Swaziland

and Tunisia, the band 470-790 MHz is also allocated on a secondary basis to the land mobile service, intended for applications ancillary to broadcasting. Stations of the land mobile service in the countries listed in this footnote shall not cause harmful interference to existing or planned stations operating in accordance with the Table in countries other than those listed in this footnote. (WRC-03)

5.297--*Additional allocation:* in Costa Rica, Cuba, El Salvador, the United States, Guatemala, Guyana, Honduras, Jamaica and Mexico, the band 512-608 MHz is also allocated to the fixed and mobile services on a primary basis, subject to agreement obtained under No. **9.21**.

5.298--*Additional allocation:* in India, the band 549.75-550.25 MHz is also allocated to the space operation service (space-to-Earth) on a secondary basis.

5.299--Not used.

5.300--*Additional allocation:* in Israel, Libya, Syria and Sudan, the band 582-790 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis.

5.301--Not used.

5.302--*Additional allocation:* in the United Kingdom, the band 590-598 MHz is also allocated to the aeronautical radionavigation service on a primary basis. All new assignments to stations in the aeronautical radionavigation service, including those transferred from the adjacent bands, shall be subject to coordination with the Administrations of the following countries: Germany, Belgium, Denmark, Spain, France, Ireland, Luxembourg, Morocco, Norway and the Netherlands.

5.304--*Additional allocation:* in the African Broadcasting Area (see Nos. **5.10** to **5.13**), the band 606-614 MHz is also allocated to the radio astronomy service on a primary basis.

5.305--*Additional allocation:* in China, the band 606-614 MHz is also allocated to the radio astronomy service on a primary basis.

5.306--*Additional allocation:* in Region 1, except in the African Broadcasting Area (see Nos. **5.10** to **5.13**), and in Region 3, the band 608-614 MHz is also allocated to the radio astronomy service on a secondary basis.

5.307--*Additional allocation:* in India, the band 608-614 MHz is also allocated to the radio astronomy service on a primary basis.

5.308--Not used.

5.309--*Different category of service:* in Costa Rica, El Salvador and Honduras, the allocation of the band 614-806 MHz to the fixed service is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21**.

5.310--(SUP - WRC-97)

5.311--Within the frequency band 620-790 MHz, assignments may be made to television stations using frequency modulation in the broadcasting-satellite service subject to agreement between the administrations concerned and those having services, operating in accordance with the Table, which may be affected (see Resolutions **33 (Rev.WRC-03)** and **507 (Rev.WRC-03)**). Such stations shall not produce a power flux-density in excess of the value –129 dB(W/m^2) for angles of arrival less than 20° (see Recommendation **705**) within the territories of other countries without the consent of the administrations of those countries. Resolution **545 (WRC-03)** applies. (WRC-03)

5.312--*Additional allocation*: in Armenia, Azerbaijan, Belarus, Bulgaria, the Russian Federation, Georgia, Hungary, Kazakhstan, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Rep., Romania, Tajikistan, Turkmenistan and Ukraine, the band 645-862 MHz is also allocated to the aeronautical radionavigation service on a primary basis. (WRC-03)

5.314--*Additional allocation:* in Austria, Italy, Moldova, Uzbekistan, the United Kingdom and Swaziland, the band 790-862 MHz is also allocated to the land mobile service on a secondary basis.

5.315--*Alternative allocation:* in Greece, Italy and Tunisia, the band 790-838 MHz is allocated to the broadcasting service on a primary basis.

5.316--*Additional allocation*: in Germany, Saudi Arabia, Bosnia and Herzegovina, Burkina Faso, Cameroon, Côte d'Ivoire, Croatia, Denmark, Egypt, Finland, Greece, Israel, Jordan, Kenya, The Former

Yugoslav Republic of Macedonia, Libyan Arab Jamahiriya, Liechtenstein, Mali, Monaco, Norway, the Netherlands, Portugal, the United Kingdom, Syrian Arab Republic, Serbia and Montenegro, Sweden and Switzerland, the band 790-830 MHz, and in these same countries and in Spain, France, Gabon and Malta, the band 830-862 MHz, are also allocated to the mobile, except aeronautical mobile, service on a primary basis. However, stations of the mobile service in the countries mentioned in connection with each band referred to in this footnote shall not cause harmful interference to, or claim protection from, stations of services operating in accordance with the Table in countries other than those mentioned in connection with the band. (WRC-03)

5.317--*Additional allocation:* in Region 2 (except Brazil and the United States), the band 806-890 MHz is also allocated to the mobile-satellite service on a primary basis, subject to agreement obtained under No. **9.21**. The use of this service is intended for operation within national boundaries.

5.317A--Administrations wishing to implement International Mobile Telecommunications-2000 (IMT-2000) may use those parts of the band 806-960 MHz which are allocated to the mobile service on a primary basis and are used or planned to be used for mobile systems (see Resolution **224 (WRC-2000)**). This identification does not preclude the use of these bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations.

5.318--*Additional allocation:* in Canada, the United States and Mexico, the bands 849-851 MHz and 894-896 MHz are also allocated to the aeronautical mobile service on a primary basis, for public correspondence with aircraft. The use of the band 849-851 MHz is limited to transmissions from aeronautical stations and the use of the band 894-896 MHz is limited to transmissions from aircraft stations.

5.319--*Additional allocation:* in Belarus, Russian Federation and Ukraine, the bands 806-840 MHz (Earth-to-space) and 856-890 MHz (space-to-Earth) are also allocated to the mobile-satellite, except aeronautical mobile-satellite (R), service. The use of these bands by this service shall not cause harmful interference to, or claim protection from, services in other countries operating in accordance with the Table of Frequency Allocations and is subject to special agreements between the administrations concerned.

5.320--*Additional allocation:* in Region 3, the bands 806-890 MHz and 942-960 MHz are also allocated to the mobile-satellite, except aeronautical mobile-satellite (R), service on a primary basis, subject to agreement obtained under No. **9.21**. The use of this service is limited to operation within national boundaries. In seeking such agreement, appropriate protection shall be afforded to services operating in accordance with the Table, to ensure that no harmful interference is caused to such services.

5.321--*Alternative allocation:* in Italy, the band 838-854 MHz is allocated to the broadcasting service on a primary basis as from 1 January 1995.

5.322--In Region 1, in the band 862-960 MHz, stations of the broadcasting service shall be operated only in the African Broadcasting Area (see Nos. **5.10** to **5.13)** excluding Algeria, Egypt, Spain, Libya, Morocco, Namibia, Nigeria, South Africa, Tanzania, Zimbabwe and Zambia, subject to agreement obtained under No. **9.21**.

5.323--*Additional allocation*: in Armenia, Azerbaijan, Belarus, Bulgaria, the Russian Federation, Hungary, Kazakhstan, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Slovakia, the Czech Rep., Romania, Tajikistan, Turkmenistan and Ukraine, the band 862-960 MHz is also allocated to the aeronautical radionavigation service on a primary basis. Such use is subject to agreement obtained under No. 9.21 with administrations concerned and limited to ground-based radiobeacons in operation on 27 October 1997 until the end of their lifetime. (WRC-03)

5.324--Not used.

5.325--*Different category of service:* in the United States, the allocation of the band 890-942 MHz to the radiolocation service is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21**.

5.325A--*Different category of service:* in Cuba, the allocation of the band 902-915 MHz to the land mobile service is on a primary basis.

5.326--*Different category of service:* in Chile, the band 903-905 MHz is allocated to the mobile, except aeronautical mobile, service on a primary basis, subject to agreement obtained under No. **9.21**.

5.327--*Different category of service:* in Australia, the allocation of the band 915-928 MHz to the radiolocation service is on a primary basis (see No. **5.33**).

5.328--The use of the band 960-1215 MHz by the aeronautical radionavigation service is reserved on a worldwide basis for the operation and development of airborne electronic aids to air navigation and any directly associated ground-based facilities.

5.328A--Stations in the radionavigation-satellite service in the band 1 164-1 215 MHz shall operate in accordance with the provisions of Resolution **609 (WRC-03)** and shall not claim protection from stations in the aeronautical radionavigation service in the band 960-1 215 MHz. No. **5.43A** does not apply. The provisions of No. **21.18** shall apply. (WRC-03)

5.328B--The use of the bands 1 164-1 300 MHz, 1 559-1 610 MHz and 5 010-5 030 MHz by systems and networks in the radionavigation-satellite service for which complete coordination or notification information, as appropriate, is received by the Radiocommunication Bureau after 1 January 2005 is subject to the application of the provisions of Nos. **9.12**, **9.12A** and **9.13**. Resolution **610 (WRC-03)** shall also apply. (WRC-03)

5.329--Use of the radionavigation-satellite service in the band 1 215-1 300 MHz shall be subject to the condition that no harmful interference is caused to, and no protection is claimed from, the radionavigation service authorized under No. **5.331**. Furthermore, the use of the radionavigation-satellite service in the band 1 215-1 300 MHz shall be subject to the condition that no harmful interference is caused to the radiolocation service. No. **5.43** shall not apply in respect of the radiolocation service. Resolution **608 (WRC-03)** shall apply. (WRC-03)

5.329A--Use of systems in the radionavigation-satellite service (space-to-space) operating in the bands 1 215-1 300 MHz and 1 559-1 610 MHz is not intended to provide safety service applications, and shall not impose any additional constraints on other systems or services operating in accordance with the Table.

5.330--*Additional allocation:* in Angola, Saudi Arabia, Bahrain, Bangladesh, Cameroon, China, the United Arab Emirates, Eritrea, Ethiopia, Guyana, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Lebanon, Libyan Arab Jamahiriya, Mozambique, Nepal, Pakistan, the Philippines, Qatar, Syrian Arab Republic, Somalia, Sudan, Chad, Togo and Yemen, the band 1 215-1 300 MHz is also allocated to the fixed and mobile services on a primary basis. (WRC-03)

5.331--*Additional allocation:* in Algeria, Germany, Saudi Arabia, Australia, Austria, Bahrain, Belarus, Belgium, Benin, Bosnia and Herzegovina, Brazil, Burkina Faso, Burundi, Cameroon, China, Korea (Rep. of), Croatia, Denmark, Egypt, the United Arab Emirates, Estonia, the Russian Federation, Finland, France, Ghana, Greece, Guinea, Equatorial Guinea, Hungary, India, Indonesia, Iran (Islamic Republic of), Iraq, Ireland, Israel, Jordan, Kenya, Kuwait, The Former Yugoslav Republic of Macedonia, Lesotho, Latvia, Liechtenstein, Lithuania, Luxembourg, Madagascar, Mali, Mauritania, Nigeria, Norway, Oman, the Netherlands, Poland, Portugal, Qatar, Syrian Arab Republic, Slovakia, the United Kingdom, Serbia and Montenegro, Slovenia, Somalia, Sudan, Sri Lanka, South Africa, Sweden, Switzerland, Thailand, Togo, Turkey, Venezuela and Viet Nam, the band 1 215-1 300 MHz is also allocated to the radionavigation service on a primary basis. In Canada and the United States, the band 1 240 1 300 MHz is also allocated to the radionavigation service, and use of the radionavigation service shall be limited to the aeronautical radionavigation service. (WRC-03)

5.332--In the band 1 215-1 260 MHz, active spaceborne sensors in the Earth exploration-satellite and space research services shall not cause harmful interference to, claim protection from, or otherwise impose constraints on operation or development of the radiolocation service, the radionavigation-satellite service and other services allocated on a primary basis.

5.333--(SUP - WRC-97)

5.334--*Additional allocation:* in Canada and the United States, the bands 1 350-1 370 MHz is also allocated to the aeronautical radionavigation service on a primary basis.

5.335--In Canada and the United States in the band 1 240-1 300 MHz, active spaceborne sensors in the

earth exploration-satellite and space research services shall not cause interference to, claim protection from, or otherwise impose constraints on operation or development of the aeronautical radionavigation service.

5.335A--In the band 1 260-1 300 MHz, active spaceborne sensors in the Earth exploration-satellite and space research services shall not cause harmful interference to, claim protection from, or otherwise impose constraints on operation or development of the radiolocation service and other services allocated by footnotes on a primary basis.

5.336--Not used.

5.337--The use of the bands 1 300-1 350 MHz, 2 700-2 900 MHz and 9 000-9 200 MHz by the aeronautical radionavigation service is restricted to ground-based radars and to associated airborne transponders which transmit only on frequencies in these bands and only when actuated by radars operating in the same band.

5.337A--The use of the band 1 300-1 350 MHz by earth stations in the radionavigation-satellite service and by stations in the radiolocation service shall not cause harmful interference to, nor constrain the operation and development of, the aeronautical radionavigation service.

5.338--In Azerbaijan, Mongolia, Kyrgyzstan, Slovakia, the Czech Rep., Romania and Turkmenistan, existing installations of the radionavigation service may continue to operate in the band 1 350-1 400 MHz. (WRC-03)

5.339--The bands 1 370-1 400 MHz, 2 640-2 655 MHz, 4 950-4 990 MHz and 15.20-15.35 GHz are also allocated to the space research (passive) and earth exploration-satellite (passive) services on a secondary basis.

5.339A--*Additional allocation:* the band 1 390-1 392 MHz is also allocated to the fixed-satellite service (Earth-to-space) on a secondary basis and the band 1 430-1 432 MHz is also allocated to the fixed-satellite service (space-to-Earth) on a secondary basis. These allocations are limited to use for feeder links for non-geostationary-satellite networks in the mobile-satellite service with service links below 1 GHz, and Resolution **745 (WRC-03)** applies. (WRC-03)

5.340--All emissions are prohibited in the following bands:

1 400-1 427 MHz,
2 690-2 700 MHz,except those provided for by No. 5.422,
10.68-10.7 GHz,except those provided for by No. 5.483,
15.35-15.4 GHz,except those provided for by No. 5.511,
23.6-24 GHz,
31.3-31.5 GHz,
31.5-31.8 GHz,in Region 2,
48.94-49.04 GHz,from airborne stations
50.2-50.4 GHz2,
52.6-54.25 GHz,
86-92 GHz,
100-102 GHz,
109.5-111.8 GHz,
114.25-116 GHz,
148.5-151.5 GHz,
164-167 GHz,
182-185 GHz,
190-191.8 GHz,
200-209 GHz,
226-231.5 GHz,
250-252 GH**z.** (WR-03)

5.341--In the bands 1 400-1 727 MHz, 101-120 GHz and 197-220 GHz, passive research is being con-

ducted by some countries in a programme for the search for intentional emissions of extraterrestrial origin.

5.342--*Additional allocation:* in Armenia, Azerbaijan, Belarus, Bulgaria, Uzbekistan, Kyrgystan, the Russian Federation and Ukraine, the band 1 429-1535 MHz is also allocated to the aeronautical mobile service on a primary basis exclusively for the purposes of aeronautical telemetry within the national territory. As of 1 April 2007, the use of the band 1 452-1 492 MHz is subject to agreement between the administrations concerned.

5.343--In Region 2, the use of the band 1 435-1 535 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile service.

5.344--*Alternative allocation:* in the United States, the band 1 452-1 525 MHz is allocated to the fixed and mobile services on a primary basis (see also No. **5.343**).

5.345--Use of the band 1 452-1 492 MHz by the broadcasting-satellite service, and by the broadcasting service, is limited to digital audio broadcasting and is subject to the provisions of Resolution **528 (WARC-92)**.

5.347--*Different category of service:* in Bangladesh, Bosnia and Herzegovina, Botswana, Bulgaria, Burkina Faso, Cuba, Denmark, Egypt, Greece, Ireland, Italy, Mozambique, Portugal, Sri Lanka, Swaziland, Yemen, Serbia and Montenegro and Zimbabwe, the allocation of the band 1 452-1 492 MHz to the broadcasting-satellite service and the broadcasting service is on a secondary basis until 1 April 2007. (WRC-03)

5.347A--In the bands:

1 452-1 492 MHz,
1 525-1 559 MHz,
1 613.8-1 626.5 MHz,
2 655-2 670 MHz,
2 670-2 690 MHz,
21.4-22.0 GHz

Resolution **739 (WRC-03)** applies[1]. (WRC-03)

5.348--The use of the band 1 518-1 525 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**. In the band 1 518-1 525 MHz stations in the mobile-satellite service shall not claim protection from the stations in the fixed service. No. **5.43A** does not apply.

5.348A--In the band 1 518-1 525 MHz, the coordination threshold in terms of the power flux-density levels at the surface of the Earth in application of No. **9.11A** for space stations in the mobile-satellite (space-to-Earth) service, with respect to the land mobile service use for specialized mobile radios or used in conjunction with public switched telecommunication networks (PSTN) operating within the territory of Japan, shall be –150 dB(W/m²) in any 4 kHz band for all angles of arrival, instead of those given in Table 5-2 of Appendix **5**. In the band 1 518-1 525 MHz stations in the mobile-satellite service shall not claim protection from stations in the mobile service in the territory of Japan. No. **5.43A** does not apply. (WRC-03)

5.348B--In the band 1 518-1 525 MHz, stations in the mobile-satellite service shall not claim protection from aeronautical mobile telemetry stations in the mobile service in the territory of the United States (see Nos. **5.343** and **5.344**) and in the countries listed in No. **5.342**. No. **5.43A** does not apply. (WRC-03)

5.348C--For the use of the bands 1 518-1 525 MHz and 1 668-1 675 MHz by the mobile-satellite service, see Resolution **225 (Rev.WRC-03)**. (WRC-03)

5.349--*Different category of service:* in Saudi Arabia, Azerbaijan, Bahrain, Bosnia and Herzegovina, Cameroon, Egypt, France, Iran (Islamic Republic of), Iraq, Israel, Kazakstan, Kuwait, The Former Yugoslav Republic of Macedonia, Lebanon, Morocco, Qatar, Syria, Kyrgyzstan, Romania, Turkmenistan, Yemen and Yugoslavia, the allocation of the band 1 525-1 530 MHz to the mobile, except aeronau-

1. Reference to No. **5.347A** will be added to the parts of the allocation table where it applies.

tical mobile, service is on a primary basis (see No. **5.33**).

5.350--*Additional allocation:* in Azerbaijan, Kyrgyzstan and Turkmenistan, the band 1 525-1 530 MHz is also allocated to the aeronautical mobile service on a primary basis.

5.351--The bands 1 525-1 544 MHz, 1 545-1 559 MHz, 1 626.5-1 645.5 MHz and 1 646.5-1 660.5 MHz shall not be used for feeder links of any service. In exceptional circumstances, however, an earth station at a specified fixed point in any of the mobile-satellite services may be authorized by an administration to communicate via space stations using these bands.

5.351A--For the use of the bands 1 525-1 544 MHz, 1 545-1 559 MHz, 1 610-1 626.5 MHz, 1 626.5-1 645.5 MHz, 1 646.5-1 660.5 MHz, 1 980-2 010 MHz, 2 170-2 200 MHz, 2 483.5-2 500 MHz, 2 500-2 520 MHz and 2 670-2 690 MHz by the mobile-satellite service, see Resolutions **212 (Rev.WRC-97)** and **225 (WRC-2000)**.

5.352--(SUP WRC-97)

5.352A--In the band 1 525-1 530 MHz, stations in the mobile-satellite service, except stations in the maritime mobile-satellite service, shall not cause harmful interference to, or claim protection from, stations of the fixed service in France and French overseas territories in Region 3, Algeria, Saudi Arabia, Egypt, Guinea, India, Israel, Italy, Jordan, Kuwait, Mali, Malta, Morocco, Mauritania, Nigeria, Oman, Pakistan, Philippines, Qatar, Syria, Tanzania, Viet Nam and Yemen notified prior to 1 April 1998.

5.353--(SUP - WRC-97)

5.353A--In applying the procedures of Section II of Article 9 to the mobile-satellite service in the bands 1530-1544 MHz and 1 626.5-1 645.5 MHz, priority shall be given to accommodating the spectrum requirements for distress, urgency and safety communications of the Global Maritime Distress and Safety System (GMDSS). Maritime mobile-satellite distress, urgency and safety communications shall have priority access and immediate availability over all other mobile satellite communications operating within a network. Mobile-satellite systems shall not cause unacceptable interference to, or claim protection from, distress, urgency and safety communications of the GMDSS. Account shall be taken of the priority of safety-related communications in the other mobile-satellite services. (The provisions of Resolution **222 (WRC-2000)** shall apply.)

5.354--The use of the bands 1 525-1 559 MHz and 1 626.5-1 660.5 MHz by the mobile-satellite services is subject to coordination under No. **9.11A**.

5.355--*Additional allocation:* in Bahrain, Bangladesh, Congo (Rep. of the), Egypt, Eritrea, Iraq, Israel, Kuwait, Lebanon, Malta, Qatar, Syrian Arab Republic, Somalia, Sudan, Chad, Togo and Yemen, the bands 1 540 1 559 MHz, 1 610-1 645.5 MHz and 1 646.5-1 660 MHz are also allocated to the fixed service on a secondary basis. (WRC-03)

5.356--The use of the band 1544-1545 MHz by the mobile-satellite service (space-to-Earth) is limited to distress and safety communications (see Article **31**).

5.357--Transmissions in the band 1 545-1 555 MHz from terrestrial aeronautical stations directly to aircraft stations, or between aircraft stations, in the aeronautical mobile (R) service are also authorized when such transmissions are used to extend or supplement the satellite-to-aircraft links.

5.357A--In applying the procedures of Section II of Article **9** to the mobile-satellite service in the bands 1 545-1 555 MHz and 1 646.5-1 656.5 MHz, priority shall be given to accommodating the spectrum requirements of the aeronautical mobile-satellite (R) service providing transmission of messages with priority 1 to 6 in Article **44**. Aeronautical mobile-satellite (R) service communications with priority 1 to 6 in Article **44** shall have priority access and immediate availability, by pre-emption if necessary, over all other mobile-satellite communications operating within a network. Mobile-satellite systems shall not cause unacceptable interference to, or claim protection from, aeronautical mobile-satellite (R) service communications with priority 1 to 6 in Article **44**. Account shall be taken of the priority of safety-related communications in the other mobile-satellite services. (The provisions of Resolution **222 (WRC-2000)** shall apply.)

5.358--(SUP - WRC-97)

5.359--*Additional allocation:* Germany, Saudi Arabia, Armenia, Austria, Azerbaijan, Belarus, Benin, Bosnia and Herzegovina, Bulgaria, Cameroon, Spain, the Russian Federation, France, Gabon, Georgia, Greece, Guinea, Guinea-Bissau, Hungary, Jordan, Kazakhstan, Kuwait, Lebanon, Libyan Arab Jamahiriya, Lithuania, Mauritania, Moldova, Mongolia, Uganda, Uzbekistan, Pakistan, Poland, Syrian Arab Republic, Kyrgyzstan, the Dem. People's Rep. of Korea, Romania, Swaziland, Tajikistan, Tanzania, Tunisia, Turkmenistan and Ukraine, the bands 1 550-1 559 MHz, 1 610-1 645.5 MHz and 1 646.5-1 660 MHz are also allocated to the fixed service on a primary basis. Administrations are urged to make all practicable efforts to avoid the implementation of new fixed-service stations in these bands. (WRC-03)

5.360 to 5.362--(SUP - WRC-97)

5.362A--In the United States, in the bands 1 555-1 559 MHz and 1 656.5-1 660.5 MHz, the aeronautical mobile-satellite (R) service shall have priority access and immediate availability, by preemption if necessary, over all other mobile-satellite communications operating within a network. Mobile-satellite systems shall not cause unacceptable interference to, or claim protection from, aeronautical mobile-satellite (R) service communications with priority 1 to 6 in Article **44**. Account shall be taken of the priority of safety-related communications in the other mobile-satellite services.

5.362B--*Additional allocation:* The band 1 559-1 610 MHz is also allocated to the fixed service on a primary basis until 1 January 2005 in Germany, Armenia, Azerbaijan, Belarus, Benin, Bosnia and Herzegovina, Bulgaria, Spain, the Russian Federation, France, Gabon, Georgia, Greece, Guinea, Guinea-Bissau, Hungary, Kazakhstan, Lithuania, Moldova, Mongolia, Nigeria, Uganda, Uzbekistan, Pakistan, Poland, Kyrgyzstan, the Dem. People's Rep. of Korea, Romania, Senegal, Swaziland, Tajikistan, Tanzania, Turkmenistan and Ukraine, and until 1 January 2010 in Saudi Arabia, Cameroon, Jordan, Kuwait, Lebanon, Libyan Arab Jamahiriya, Mali, Mauritania, Syrian Arab Republic and Tunisia. After these dates, the fixed service may continue to operate on a secondary basis until 1 January 2015, at which time this allocation shall no longer be valid. Administrations are urged to take all practicable steps to protect the radionavigation-satellite service and the aeronautical radionavigation service and not authorize new frequency assignments to fixed-service systems in this band. (WRC-03)

5.362C--*Additional allocation:* in Bahrain, Bangladesh, Congo, Egypt, Eritrea, Iraq, Israel, Jordan, Kuwait, Lebanon, Malta, Morocco, Qatar, Syria, Somalia, Sudan, Chad, Togo and Yemen, the band 1559-1610 MHz is also allocated to the fixed service on a secondary basis until 1 January 2015, at which time this allocation shall no longer be valid. Administrations are urged to take all practicable steps to protect the radionavigation-satellite service and not authorize new frequency assignments to fixed-service systems in this band.

5.363--*Alternative allocation:* in Sweden, the band 1 590-1 626.5 MHz is allocated to the aeronautical radionavigation service on a primary basis.

5.364--The use of the band 1 610-1 626.5 MHz by the mobile-satellite service (Earth-to-space) and by the radiodetermination-satellite service (Earth-to-space) is subject to coordination under No. **9.11A**. A mobile earth station operating in either of the services in this band shall not produce a peak e.i.r.p. density in excess of in the part of the band used by systems operating in accordance with the provisions of No. **5.366** (to which No. **4.10** applies), unless otherwise agreed by the affected administrations. In the part of the band where such systems are not operating, the mean e.i.r.p. density of a mobile earth station shall not exceed –3 dB(W/4 kHz). Stations of the mobile-satellite service shall not claim protection from stations in the aeronautical radionavigation service, stations operating in accordance with the provisions of No. **5.366** and stations in the fixed service operating in accordance with the provisions of No. **5.359**. Administrations responsible for the coordination of mobile-satellite networks shall make all practicable efforts to ensure protection of stations operating in accordance with the provisions of No. **5.366**.

5.365--The use of the band 1 613.8-1 626.5 MHz by the mobile-satellite service (space-to-Earth) is subject to coordination under No. **9.11A**.

5.366--The band 1 610-1 626.5 MHz is reserved on a worldwide basis for the use and development of airborne electronic aids to air navigation and any directly associated ground-based or satellite-borne facilities. Such satellite use is subject to agreement obtained under No. **9.21**.

5.367--*Additional allocation:* The bands 1 610-1 626.5 MHz and 5 000-5 150 MHz are also allocated to the aeronautical mobile-satellite (R) service on a primary basis, subject to agreement obtained under No. **9.21**.

5.368--With respect to the radiodetermination-satellite and mobile-satellite services the provisions of No. **4.10** do not apply in the band 1 610-1 626.5 MHz, with the exception of the aeronautical radionavigation-satellite service.

5.369--*Different category of service*: in Angola, Australia, Burundi, China, Eritrea, Ethiopia, India, Iran (Islamic Republic of), Israel, Lebanon, Liberia, Libyan Arab Jamahiriya, Madagascar, Mali, Pakistan, Papua New Guinea, Syrian Arab Republic, Dem. Rep. of the Congo, Sudan, Swaziland, Togo and Zambia, the allocation of the band 1 610-1 626.5 MHz to the radiodetermination-satellite service (Earth-to-space) is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21** from countries not listed in this provision. (WRC-03)

5.370--*Different category of service:* in Venezuela, the allocation to the radiodetermination-satellite service in the band 1 610-1 626.5 MHz (Earth-to-space) is on a secondary basis.

5.371--*Additional allocation:* in Region 1, the bands 1 610-1 626.5 MHz (Earth-to-space) and 2 483.5-2 500 MHz (space-to-Earth) are also allocated to the radiodetermination-satellite service on a secondary basis, subject to agreement obtained under No. **9.21**.

5.372--Harmful interference shall not be caused to stations of the radio astronomy service using the band 1 610.6-1 613.8 MHz by stations of the radiodetermination-satellite and mobile-satellite services (No. **29.13** applies).

5.373--Not used.

5.373A--(SUP - WRC-97)

5.374--Mobile earth stations in the mobile-satellite service operating in the bands 1 631.5-1 634.5 MHz and 1 656.5-1 660 MHz shall not cause harmful interference to stations in the fixed service operating in the countries listed in No. **5.359**.

5.375--The use of the band 1 645.5-1 646.5 MHz by the mobile-satellite service (Earth-to-space) and for inter-satellite links is limited to distress and safety communications (see Article **31**).

5.376--Transmissions in the band 1 646.5-1 656.5 MHz from aircraft stations in the aeronautical mobile (R) service directly to terrestrial aeronautical stations, or between aircraft stations, are also authorized when such transmissions are used to extend or supplement the aircraft-to-satellite links.

5.376A--Mobile earth stations operating in the band 1 660-1 660.5 MHz shall not cause harmful interference to stations in the radio astronomy service.

5.377--(SUP - WRC-03)

5.378--Not used.

5.379--*Additional allocation:* in Bangladesh, India, Indonesia, Nigeria and Pakistan, the band 1 660.5-1 668.4 MHz is also allocated to the meteorological aids service on a secondary basis.

5.379A--Administrations are urged to give all practicable protection in the band 1 660.5-1 668.4 MHz for future research in radio astronomy, particularly by eliminating air-to-ground transmissions in the meteorological aids service in the band 1 664.4-1 668.4 MHz as soon as practicable.

5.379B--The use of the band 1 668-1 675 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**. (WRC-03)

5.379C--In order to protect the radio astronomy service in the band 1 668-1 670 MHz, the aggregate power flux-density (pfd) values produced by mobile earth stations in a network of the mobile-satellite service operating in this band shall not exceed –181 dB(W/m²) in 10 MHz and -194 dB(W/m²) in any 20 kHz at any radio astronomy station recorded in the Master International Frequency Register, for more than 2% of integration periods of 2 000 s.

5.379D--For sharing of the band 1 668-1 675 MHz between the mobile-satellite service and the fixed, mobile and space research (passive) services, Resolution **744 (WRC-03)** shall apply. (WRC-03)

5.379E--In the band 1 668.4-1 675 MHz, stations in the mobile-satellite service shall not cause harmful

interference to stations in the meteorological aids service in China, Iran (Islamic Republic of), Japan and Uzbekistan. In the band 1 668.4-1 675 MHz, administrations are urged not to implement new systems in the meteorological aids service and are encouraged to migrate existing meteorological aids service operations to other bands as soon as practicable. (WRC-03)

5.380--The bands 1 670-1 675 MHz and 1 800-1 805 MHz are intended for use, on a worldwide basis, by administrations wishing to implement aeronautical public correspondence. The use of the band 1 670-1 675 MHz by stations in the systems for public correspondence with aircraft is limited to transmissions from aeronautical stations and the use of the band 1 800-1 805 MHz is limited to transmissions from aircraft stations.

5.380A--In the band 1 670-1 675 MHz, stations in the mobile-satellite service shall not cause harmful interference to, nor constrain the development of, existing earth stations in the meteorological-satellite service notified in accordance with Resolution **670 (WRC-03)**. (WRC-03)

5.381--*Additional allocation:* in Afghanistan, Costa Rica, Cuba, India, Iran (Islamic Republic of) and Pakistan, the band 1 690-1 700 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-03)

5.382--*Different category of service:* in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Bosnia and Herzegovina, Bulgaria, Congo (Rep. of the), Egypt, the United Arab Emirates, Eritrea, Ethiopia, the Russian Federation, Guinea, Hungary, Iraq, Israel, Jordan, Kazakhstan, Kuwait, the Former Yugoslav Republic of Macedonia, Lebanon, Mauritania, Moldova, Mongolia, Oman, Uzbekistan, Poland, Qatar, Syrian Arab Republic, Kyrgyzstan, Romania, Serbia and Montenegro, Somalia, Tajikistan, Tanzania, Turkmenistan, Ukraine and Yemen, the allocation of the band 1 690-1 700 MHz to the fixed and mobile, except aeronautical mobile, services is on a primary basis (see No. **5.33**), and in the Dem. People's Rep. of Korea, the allocation of the band 1 690-1 700 MHz to the fixed service is on a primary basis (see No. 5.33) and to the mobile, except aeronautical mobile, service on a secondary basis. (WRC-03)

5.383--Not used.

5.384--*Additional allocation:* in India, Indonesia and Japan, the band 1 700-1 710 MHz is also allocated to the space research service (space-to-Earth) on a primary basis.

5.384A--The bands, or portions of the bands, 1 710-1 885 MHz and 2 500-2 690 MHz, are identified for use by administrations wishing to implement International Mobile Telecommunications-2000 (IMT-2000) in accordance with Resolution **223 (WRC-2000)**. This identification does not preclude the use of these bands by any application of the services to which they are allocated and does not establish priority in the Radio Regulations.

5.385--*Additional allocation:* the band 1 718.8-1 722.2 MHz is also allocated to the radio astronomy service on a secondary basis for spectral line observations.

5.386--*Additional allocation:* the band 1 750-1 850 MHz is also allocated to the space operation (Earth-to-space) and space research (Earth-to-space) services in Region 2, in Australia, Guam, India, Indonesia and Japan on a primary basis, subject to agreement obtained under No. **9.21**, having particular regard to troposcatter systems. (WRC-03)

5.387--*Additional allocation:* in Azerbaijan, Belarus, Georgia, Kazakhstan, Mongolia, Kyrgyzstan, Slovakia, Romania, Tajikistan and Turkmenistan, the band 1 770-1 790 MHz is also allocated to the meteorological-satellite service on a primary basis, subject to agreement obtained under No. **9.21**. (WRC-03)

5.388--The bands 1885-2025 MHz and 2110-2200 MHz are intended for use, on a worldwide basis, by administrations wishing to implement International Mobile Telecommunications-2000 (IMT-2000). Such use does not preclude the use of these bands by other services to which they are allocated. The bands should be made available for IMT-2000 in accordance with Resolution **212 (Rev.WRC-97)**. (See also Resolution **223 (WRC-2000)**).

5.388A--In Regions 1 and 3, the bands 1 885-1 980 MHz, 2 010-2 025 MHz and 2 110-2 170 MHz and, in Region 2, the bands 1 885-1 980 MHz and 2 110-2 160 MHz may be used by high altitude platform stations as base stations to provide International Mobile Telecommunications-2000 (IMT-2000), in

accordance with Resolution **221 (Rev.WRC-03)**. Their use by IMT-2000 applications using high altitude platform stations as base stations does not preclude the use of these bands by any station in the services to which they are allocated and does not establish priority in the Radio Regulations. (WRC-03)

5.388B--In Algeria, Saudi Arabia, Bahrain, Benin, Burkina Faso, Cameroon, China, Comoros, Côte d'Ivoire, Cuba, Djibouti, Egypt, United Arab Emirates, Eritrea, Ethiopia, Gabon, Ghana, India, Iran (Islamic Republic of), Israel, Jordan, Kenya, Kuwait, Libyan Arab Jamahiriya, Mali, Morocco, Mauritania, Nigeria, Oman, Uganda, Qatar, Syrian Arab Republic, Senegal, Singapore, Sudan, Tanzania, Chad, Togo, Tunisia, Yemen, Zambia and Zimbabwe, for the purpose of protecting fixed and mobile services, including IMT-2000 mobile stations, in their territories from co-channel interference, a HAPS operating as an IMT-2000 base station in neighbouring countries, in the bands referred to in No. **5.388A**, shall not exceed a co-channel power flux-density (pfd) of -127 dB ($W/(m^2 \cdot MHz)$) at the Earth's surface outside a country's borders unless explicit agreement of the affected administration is provided at the time of the notification of HAPS. (WRC-03)

5.389--Not used.

5.389A--The use of the bands 1 980-2 010 MHz and 2 170-2 200 MHz by the mobile-satellite service is subject to coordination under No. **9.11A** and to the provisions of Resolution **716 (WRC-95)**[2]. The use of these bands shall not commence before 1 January 2000; however the use of the band 1 980-1 990 MHz in Region 2 shall not commence before 1 January 2005.

5.389B--The use of the band 1980-1990 MHz by the mobile-satellite service shall not cause harmful interference to or constrain the development of the fixed and mobile services in Argentina, Brazil, Canada, Chile, Ecuador, the United States, Honduras, Jamaica, Mexico, Peru, Suriname, Trinidad and Tobago, Uruguay and Venezuela.

5.389C--The use of the bands 2 010-2 025 MHz and 2 160-2 170 MHz in Region 2 by the mobile-satellite service shall not commence before 1 January 2002 and is subject to coordination under No. **9.11A** and to the provisions of Resolution **716 (WRC-95)**[3].

5.389D--(SUP - WRC-03)

5.389E--The use of the bands 2 010-2 025 MHz and 2 160-2 170 MHz by the mobile-satellite service in Region 2 shall not cause harmful interference to or constrain the development of the fixed and mobile services in Regions 1 and 3.

5.389F--In Algeria, Benin, Cape Verde, Egypt, Iran (Islamic Republic of), Mali, Syria and Tunisia, the use of the bands 1 980-2 010 MHz and 2 170-2 200 MHz by the mobile-satellite service shall neither cause harmful interference to the fixed and mobile services, nor hamper the development of those services prior to 1 January 2005, nor shall the former service request protection from the latter services.

5.390--In Argentina, Brazil, Chile, Colombia, Cuba, Ecuador, Suriname and Uruguay, the use of the bands 2 010-2 025 MHz and 2 160-2 170 MHz by the mobile-satellite services shall not cause harmful interference to stations in the fixed and mobile services before 1 January 2005. After this date, the use of these bands is subject to coordination under No. **9.11A** and to the provisions of Resolution **716 (WRC-95)**[4].

5.391--In making assignments to the mobile service in the bands 2 025-2 110 MHz and 2 200-2 290 MHz, administrations shall not introduce high-density mobile systems, as described in Recommendation ITU-R SA.1154, and shall take that Recommendation into account for the introduction of any other type of mobile system.

5.392--Administrations are urged to take all practicable measures to ensure that space-to-space transmissions between two or more non-geostationary satellites, in the space research, space operations and Earth exploration-satellite services in the bands 2 025-2 110 MHz and 2 200-2 290 MHz, shall not impose any

2. Note by the Secretariat: This Resolution was revised by WRC-2000.
3. Note by the Secretariat: This Resolution was revised by WRC-2000.
4. Note by the Secretariat: This Resolution was revised by WRC-2000.

constraints on Earth-to-space, space-to-Earth and other space-to-space transmissions of those services and in those bands between geostationary and non-geostationary satellites.

5.392A--*Additional allocation:* in Russian Federation, the band 2 160-2 200 MHz is also allocated to the space research service (space-to-Earth) on a primary basis until 1 January 2005. Stations in the space research service shall not cause harmful interference to, or claim protection from, stations in the fixed and mobile services operating in this frequency band.

5.393--*Additional allocation:* in the United States, India and Mexico, the band 2 310-2 360 MHz is also allocated to the broadcasting-satellite service (sound) and complementary terrestrial sound broadcasting service on a primary basis. Such use is limited to digital audio broadcasting and is subject to the provisions of Resolution **528 (WARC-92)**, with the exception of *resolves* 3 in regard to the limitation on broadcasting-satellite systems in the upper 25 MHz.

5.394--In the United States, the use of the band 2 300-2 390 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile services. In Canada, the use of the band 2 300-2 483.5 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile services.

5.395--In France and Turkey, the use of the band 2 310-2 360 MHz by the aeronautical mobile service for telemetry has priority over other uses by the mobile service. (WRC-03)

5.396--Space stations of the broadcasting-satellite service in the band 2 310-2 360 MHz operating in accordance with No. **5.393** that may affect the services to which this band is allocated in other countries shall be coordinated and notified in accordance with Resolution **33 (Rev.WRC-97)**. Complementary terrestrial broadcasting stations shall be subject to bilateral coordination with neighbouring countries prior to their bringing into use.

5.397--*Different category of service:* in France, the band 2 450-2 500 MHz is allocated on a primary basis to the radiolocation service (see No. **5.33**). Such use is subject to agreement with administrations having services operating or planned to operate in accordance with the Table of Frequency Allocations which may be affected.

5.398--In respect of the radiodetermination-satellite service in the band 2 483.5-2 500 MHz, the provisions of No. **4.10** do not apply.

5.399--In Region 1, in countries other than those listed in No. **5.400**, harmful interference shall not be caused to, or protection shall not be claimed from, stations of the radiolocation service by stations of the radiodetermination satellite service.

5.400--*Different category of service:* in Angola, Australia, Bangladesh, Burundi, China, Eritrea, Ethiopia, India, Iran (Islamic Republic of), Lebanon, Liberia, Libyan Arab Jamahiriya, Madagascar, Mali, Pakistan, Papua New Guinea, Dem. Rep. of the Congo, Syrian Arab Republic, Sudan, Swaziland, Togo and Zambia, the allocation of the band 2 483.5-2 500 MHz to the radiodetermination-satellite service (space-to-Earth) is on a primary basis (see No. **5.33**), subject to agreement obtained under No. **9.21** from countries not listed in this provision. (WRC-03)

5.401--Not used.

5.402--The use of the band 2 483.5-2 500 MHz by the mobile-satellite and the radiodetermination-satellite services is subject to the coordination under No. **9.11A**. Administrations are urged to take all practicable steps to prevent harmful interference to the radio astronomy service from emissions in the 2 483.5-2 500 MHz band, especially those caused by second-harmonic radiation that would fall into the 4 990-5 000 MHz band allocated to the radio astronomy service worldwide.

5.403--Subject to agreement obtained under No. **9.21**, the band 2 520-2 535 MHz (until 1 January 2005 the band 2 500-2 535 MHz) may also be used for the mobile-satellite (space-to-Earth), except aeronautical mobile-satellite, service for operation limited to within national boundaries. The provisions of No. **9.11A** apply.

5.404--*Additional allocation:* in India and Iran (Islamic Republic of), the band 2 500-2 516.5 MHz may also be used for the radiodetermination-satellite service (space-to-Earth) for operation limited to within

national boundaries, subject to agreement obtained under No. **9.21**.

5.405--*Additional allocation:* in France, the band 2 500-2 550 MHz is also allocated to the radiolocation service on a primary basis. Such use is subject to agreement with the administrations having services operating or planned to operate in accordance with the Table which may be affected.

5.406--Not used.

5.407--In the band 2 500-2 520 MHz, the power flux-density at the surface of the Earth from space stations operating in the mobile-satellite (space-to-Earth) service shall not exceed –152 dB(W/(m² · 4 kHz)) in Argentina, unless otherwise agreed by the administrations concerned.

5.408--(SUP - WRC-2000)

5.409--Administrations shall make all practicable efforts to avoid developing new tropospheric scatter systems in the band 2 500-2 690 MHz.

5.410--The band 2 500-2 690 MHz may be used for tropospheric scatter systems in Region 1, subject to agreement obtained under No. **9.21**.

5.411--When planning new tropospheric scatter radio-relay links in the band 2 500-2 690 MHz, all possible measures shall be taken to avoid directing the antennae of these links towards the geostationary-satellite orbit.

5.412--*Alternative allocation:* in Azerbaijan, Bulgaria, Kyrgyzstan and Turkmenistan, the band 2 500-2 690 MHz is allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

5.413--In the design of systems in the broadcasting-satellite service in the bands between 2 500 MHz and 2 690 MHz, administrations are urged to take all necessary steps to protect the radio astronomy service in the band 2 690-2 700 MHz.

5.414--The allocation of the frequency band 2500-2520 MHz to the mobile-satellite service (space-to-Earth) shall be effective on 1 January 2005 and is subject to coordination under No. **9.11A**.

5.415--The use of the bands 2 500-2 690 MHz in Region 2 and 2 500-2 535 MHz and 2 655-2 690 MHz in Region 3 by the fixed-satellite service is limited to national and regional systems, subject to agreement obtained under No. **9.21**, giving particular attention to the broadcasting-satellite service in Region 1. In the direction space-to-Earth, the power flux-density at the Earth's surface shall not exceed the values given in Article **21**, Table 21-4.

5.415A--*Additional allocation:* in India and Japan, subject to agreement obtained under No. **9.21**, the band 2515-2535 MHz may also be used for the aeronautical mobile-satellite service (space-to-Earth) for operation limited to within their national boundaries.

5.416--The use of the band 2 520-2 670 MHz by the broadcasting-satellite service is limited to national and regional systems for community reception, subject to agreement obtained under No. **9.21**. (WRC-03)

5.417--(SUP-WRC-2000)

5.417A--In applying provision No. **5.418**, in Korea (Rep. of) and Japan, *resolves* 3 of Resolution **528 (Rev.WRC-03)** is relaxed to allow the broadcasting-satellite service (sound) and the complementary terrestrial broadcasting service to additionally operate on a primary basis in the band 2 605-2630 MHz. This use is limited to systems intended for national coverage. An administration listed in this provision shall not have simultaneously two overlapping frequency assignments, one under this provision and the other under No. **5.416**. The provisions of No. **5.416** and Table **21-4** of Article **21** do not apply. Use of non-geostationary-satellite systems in the broadcasting-satellite service (sound) in the band 2 605-2 630 MHz is subject to the provisions of Resolution **539 (Rev.WRC-03)**. The power flux-density at the Earth's surface produced by emissions from a geostationary broadcasting-satellite service (sound) space station operating in the band 2 605-2 630 MHz for which complete Appendix **4** coordination information, or notification information, has been received after 4 July 2003, for all conditions and for all methods of modulation, shall not exceed the following limits:

$$-130 \quad \text{dB(W/(m}^2 \cdot \text{MHz))} \qquad \text{for } 0^\circ \le \theta \le 5^\circ$$

$$-130 + 0.4\,(\theta - 5) \quad \text{dB(W/(m}^2 \cdot \text{MHz))} \qquad \text{for } 5^\circ < \theta \le 25^\circ$$

-122 dB(W/(m² · MHz)) for $25^\circ < \theta \leq 90^\circ$

where θ is the angle of arrival of the incident wave above the horizontal plane, in degrees. These limits may be exceeded on the territory of any country whose administration has so agreed. In the case of the broadcasting-satellite service (sound) networks of Korea (Rep. of), as an exception to the limits above, the pfd value of –122 dB(W/(m² · MHz)) shall be used as a threshold for coordination under No. **9.11** in an area of 1000 km around the territory of the administration notifying the BSS (sound) system, for angles of arrival greater than 35 degrees.

5.417B--In Korea (Rep. of) and Japan, use of the band 2 605-2 630 MHz by non-geostationary-satellite systems in the broadcasting-satellite service (sound), pursuant to No. **5.417A**, for which complete Appendix **4** coordination information, or notification information, has been received after 4 July 2003, is subject to the application of the provisions of No. **9.12A**, in respect of geostationary-satellite networks for which complete Appendix **4** coordination information, or notification information, is considered to have been received after 4 July 2003, and No. **22.2** does not apply. No. **22.2** shall continue to apply with respect to geostationary-satellite networks for which complete Appendix **4** coordination information, or notification information, is considered to have been received before 5 July 2003. (WRC-03)

5.417C--Use of the band 2 605-2 630 MHz by non-geostationary-satellite systems in the broadcasting-satellite service (sound), pursuant to No. **5.417A**, for which complete Appendix **4** coordination information, or notification information, has been received after 4 July 2003, is subject to the application of the provisions of No. **9.12**. (WRC-03)

5.417D--Use of the band 2 605-2 630 MHz by geostationary-satellite networks for which complete Appendix **4** coordination information, or notification information, has been received after 4 July 2003 is subject to the application of the provisions of No. **9.13** with respect to non-geostationary-satellite systems in the broadcasting-satellite service (sound), pursuant to No. **5.417A**, and No. **22.2** does not apply. (WRC-03)

5.418--*Additional allocation:* in Korea (Rep. of), India, Japan, Pakistan and Thailand, the band 2535-2655 MHz is also allocated to the broadcasting-satellite service (sound) and complementary terrestrial broadcasting service on a primary basis. Such use is limited to digital audio broadcasting and is subject to the provisions of Resolution **528 (Rev.WRC-03)**. The provisions of No. **5.416** and Table **21-4** of Article **21**, do not apply to this additional allocation. Use of non-geostationary-satellite systems in the broadcasting-satellite service (sound) is subject to Resolution **539 (Rev.WRC-03)**. Geostationary broadcasting-satellite service (sound) systems for which complete Appendix **4** coordination information has been received after 1 June 2005 are limited to systems intended for national coverage. The power flux-density at the Earth's surface produced by emissions from a geostationary broadcasting-satellite service (sound) space station operating in the band 2 630-2 655 MHz, and for which complete Appendix **4** coordination information has been received after 1 June 2005, shall not exceed the following limits, for all conditions and for all methods of modulation:

-130 dB(W/(m² · MHz)) for $0^\circ \leq \theta \leq 5^\circ$

$-130 + 0.4\ (\theta - 5)$ dB(W/(m² · MHz)) for $5^\circ < \theta \leq 25^\circ$

-122 dB(W/(m² · MHz)) for $25^\circ < \theta \leq 90^\circ$

where θ is the angle of arrival of the incident wave above the horizontal plane, in degrees. These limits may be exceeded on the territory of any country whose administration has so agreed. As an exception to the limits above, the pfd value of –122 dB(W/(m² · MHz)) shall be used as a threshold for coordination under No. **9.11** in an area of 1500 km around the territory of the administration notifying the broadcasting-satellite service (sound) system. In addition, the pfd value shall not exceed -100 dB(W/(m^2 · MHz)) anywhere on the territory of the Russian Federation.

In addition, an administration listed in this provision shall not have simultaneously two overlapping frequency assignments, one under this provision and the other under No. **5.416** for systems for which

complete Appendix **4** coordination information has been received after 1 June 2005.

5.418A--In certain Region 3 countries listed in No. **5.418**, use of the band 2 630-2 655 MHz by non-geostationary-satellite systems in the broadcasting-satellite service (sound) for which complete Appendix **4** coordination information, or notification information, has been received after 2 June 2000, is subject to the application of the provisions of No. **9.12A**, in respect of geostationary-satellite networks for which complete Appendix **4** coordination information, or notification information, is considered to have been received after 2 June 2000, and No. **22.2** does not apply. No. **22.2** shall continue to apply with respect to geostationary-satellite networks for which complete Appendix **4** coordination information, or notification information, is considered to have been received before 3 June 2000. (WRC-03)

5.418B--Use of the band 2 630-2 655 MHz by non-geostationary-satellite systems in the broadcasting-satellite service (sound), pursuant to No. **5.418**, for which complete Appendix **4** coordination information, or notification information, has been received after 2 June 2000, is subject to the application of the provisions of No. **9.12**. (WRC-03)

5.418C--Use of the band 2 630-2 655 MHz by geostationary-satellite networks for which complete Appendix **4** coordination information, or notification information, has been received after 2 June 2000 is subject to the application of the provisions of No. **9.13** with respect to non-geostationary-satellite systems in the broadcasting-satellite service (sound), pursuant to No. **5.418** and No. **22.2** does not apply.

5.419--The allocation of the frequency band 2 670-2 690 MHz to the mobile-satellite service shall be effective from 1 January 2005. When introducing systems of the mobile-satellite service in this band, administrations shall take all necessary steps to protect the satellite systems operating in this band prior to 3 March 1992. The coordination of mobile-satellite systems in the band shall be in accordance with No. **9.11A**.

5.420--The band 2 655-2 670 MHz (until 1 January 2005 the band 2 655-2 690 MHz) may also be used for the mobile-satellite (Earth-to-space), except aeronautical mobile-satellite, service for operation limited to within national boundaries, subject to agreement obtained under No. **9.21**. The coordination under No. **9.11A** applies.

5.420A--*Additional allocation:* in India and Japan, subject to agreement obtained under No. **9.21**, the band 2 670-2 690 MHz may also be used for the aeronautical mobile-satellite service (Earth-to-space) for operation limited to within their national boundaries.

5.421--(Suppressed by WRC-03)

5.422--*Additional allocation:* in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Bosnia and Herzegovina, Brunei Darussalam, Congo (Rep. of the), Côte d'Ivoire, Cuba, Egypt, the United Arab Emirates, Eritrea, Ethiopia, the Russian Federation, Gabon, Georgia, Guinea, Guinea-Bissau, Iran (Islamic Republic of), Iraq, Israel, Jordan, Lebanon, Mauritania, Moldova, Mongolia, Nigeria, Oman, Uzbekistan, Pakistan, the Philippines, Qatar, Syrian Arab Republic, Kyrgyzstan, the Dem. Rep. of the Congo, Romania, Serbia and Montenegro, Somalia, Tajikistan, Tunisia, Turkmenistan, Ukraine and Yemen, the band 2 690-2 700 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. Such use is limited to equipment in operation by 1 January 1985. (WRC-03)

5.423--In the band 2 700-2 900 MHz, ground-based radars used for meteorological purposes are authorized to operate on a basis of equality with stations of the aeronautical radionavigation service.

5.424--*Additional allocation:* in Canada, the band 2 850-2 900 MHz is also allocated to the maritime radionavigation service, on a primary basis, for use by shore-based radars.

5.424A--In the band 2 900-3 100 MHz, stations in the radiolocation service shall not cause harmful interference to, nor claim protection from, radar systems in the radionavigation service. (WRC-03)

5.425--In the band 2 900-3 100 MHz, the use of the shipborne interrogator-transponder system (SIT) shall be confined to the sub-band 2 930-2 950 MHz.

5.426--The use of the band 2 900-3 100 MHz by the aeronautical radionavigation service is limited to ground-based radars.

5.427--In the bands 2 900-3 100 MHz and 9 300-9 500 MHz, the response from radar transponders shall

not be capable of being confused with the response from radar beacons (racons) and shall not cause interference to ship or aeronautical radars in the radionavigation service, having regard, however, to No. **4.9**.
5.428--*Additional allocation:* in Azerbaijan, Cuba, Mongolia, Kyrgyzstan, Romania and Turkmenistan, the band 3 100-3 300 MHz is also allocated to the radionavigation service on a primary basis. (WRC-03)
5.429--*Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, China, Congo (Rep. of the), Korea (Rep. of), the United Arab Emirates, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kenya, Kuwait, Lebanon, Libyan Arab Jamahiriya, Malaysia, Oman, Pakistan, Qatar, Syrian Arab Republic, Dem. People's Rep. of Korea and Yemen, the band 3 300-3 400 MHz is also allocated to the fixed and mobile services on a primary basis. The countries bordering the Mediterranean shall not claim protection for their fixed and mobile services from the radiolocation service. (WRC-03)
5.430--*Additional allocation:* in Azerbaijan, Cuba, Mongolia, Kyrgyzstan, Romania and Turkmenistan, the band 3 300-3 400MHz is also allocated to the radionavigation service on a primary basis. (WRC-03)
5.431--*Additional allocation*: in Germany, Israel and the United Kingdom, the band 3 400-3 475 MHz is also allocated to the amateur service on a secondary basis. (WRC-03)
5.432--*Different category of service:* in Korea (Rep. of), Japan and Pakistan, the allocation of the band 3 400-3 500 MHz to the mobile, except aeronautical mobile, service is on a primary basis (see No. **5.33**).
5.433--In Regions 2 and 3, in the band 3 400-3 600 MHz the radiolocation service is allocated on a primary basis. However, all administrations operating radiolocation systems in this band are urged to cease operations by 1985. Thereafter, administrations shall take all practicable steps to protect the fixed-satellite service and coordination requirements shall not be imposed on the fixed-satellite service.
5.435--In Japan, in the band 3 620-3 700 MHz, the radiolocation service is excluded.
5.438--Use of the band 4 200-4 400 MHz by the aeronautical radionavigation service is reserved exclusively for radio altimeters installed on board aircraft and for the associated transponders on the ground. However, passive sensing in the earth exploration-satellite and space research services may be authorized in this band on a secondary basis (no protection is provided by the radio altimeters).
5.439--*Additional allocation:* in Iran (Islamic Republic of) and Libya, the band 4 200-4 400 MHz is also allocated to the fixed service on a secondary basis.
5.440--The standard frequency and time signal-satellite service may be authorized to use the frequency 4 202 MHz for space-to-Earth transmissions and the frequency 6 427 MHz for Earth-to-space transmissions. Such transmissions shall be confined within the limits of $\pm$ 2 MHz of these frequencies, subject to agreement obtained under No. **9.21**.
5.441--The use of the bands 4 500-4 800 MHz (space-to-Earth), 6 725-7 025 MHz (Earth-to-space) by the fixed-satellite service shall be in accordance with the provisions of Appendix **30B**. The use of the bands 10.7-10.95 GHz (space-to-Earth), 11.2-11.45 GHz (space-to-Earth) and 12.75-13.25 GHz (Earth-to-space) by geostationary-satellite systems in the fixed-satellite service shall be in accordance with the provisions of Appendix **30B**. The use of the bands 10.7-10.95 GHz (space-to Earth), 11.2-11.45 GHz (space-to-Earth) and 12.75-13.25 GHz (Earth-to-space) by a non-geostationary-satellite system in the fixed-satellite service is subject to application of the provisions of No. **9.12** for coordination with other non-geostationary-satellite systems in the fixed-satellite service. Non-geostationary-satellite systems in the fixed-satellite service shall not claim protection from geostationary-satellite networks in the fixed-satellite service operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the Bureau of the complete coordination or notification information, as appropriate, for the non-geostationary-satellite systems in the fixed-satellite service and of the complete coordination or notification information, as appropriate, for the geostationary-satellite networks, and No. **5.43A** does not apply. Non-geostationary-satellite systems in the fixed-satellite service in the above bands shall be operated in such a way that any unacceptable interference that may occur during their operation shall be rapidly eliminated.
5.442--In the bands 4 825-4 835 MHz and 4 950-4 990 MHz, the allocation to the mobile service is restricted to the mobile, except aeronautical mobile service.

5.443--*Different category of service:* in Argentina, Australia and Canada, the allocation of the bands 4 825-4 835 MHz and 4 950-4 990 MHz to the radio astronomy service is on a primary basis (see No. **5.33)**.

5.443B--In order not to cause harmful interference to the microwave landing system operating above 5 030 MHz, the aggregate power flux-density produced at the Earth's surface in the band 5 030-5 150 MHz by all the space stations within any radionavigation-satellite service system (space-to-Earth) operating in the band 5 010-5 030 MHz shall not exceed –124.5 dB(W/m²) in a 150 kHz band. In order not to cause harmful interference to the radio astronomy service in the band 4 990-5 000 MHz, radionavigation-satellite service systems operating in the band 5 010-5 030 MHz shall comply with the limits in the band 4990-5000 MHz defined in Resolution **741 (WRC-03)**.

5.443A--(Suppressed by WRC-03)

5.443B--In order not to cause harmful interference to the microwave landing system operating above 5 030 MHz, the aggregate power flux-density produced at the Earth's surface in the band 5 030-5 150 MHz by all the space stations within any radionavigation-satellite service system (space-to-Earth) operating in the band 5 010-5 030 MHz shall not exceed –124.5 dB(W/m²) in a 150 kHz band. In order not to cause harmful interference to the radio astronomy service in the band 4 990-5 000 MHz, radionavigation-satellite service systems operating in the band 5 010-5 030 MHz shall comply with the limits in the band 4 990-5 000 MHz defined in Resolution **741 (WRC-03)**. (WRC-03)

5.444--The band 5 030-5 150 MHz is to be used for the operation of the international standard system (microwave landing system) for precision approach and landing. The requirements of this system shall take precedence over other uses of this band. For the use of this band, No. **5.444A** and Resolution **114 (Rev.WRC-03)** apply. (WRC-03)

5.444A--*Additional allocation:* the band 5 091-5 150 MHz is also allocated to the fixed-satellite service (Earth-to-space) on a primary basis. This allocation is limited to feeder links of non-geostationary mobile-satellite systems in the mobile-satellite service and is subject to coordination under No. **9.11A**.

In the band 5 091-5 150 MHz, the following conditions also apply:

- prior to 1 January 2018, the use of the band 5 091-5 150 MHz by feeder links of non-geostationary-satellite systems in the mobile-satellite service shall be made in accordance with Resolution **114 (Rev.WRC-03)**;
- prior to 1 January 2018, the requirements of existing and planned international standard systems for the aeronautical radionavigation service which cannot be met in the 5000-5091 MHz band, shall take precedence over other uses of this band;
- after 1 January 2012, no new assignments shall be made to earth stations providing feeder links of non-geostationary mobile-satellite systems;
- after 1 January 2018, the fixed-satellite service will become secondary to the aeronautical radionavigation service. (WRC-03)

5.445--Not Used.

5.446--*Additional allocation:* in the countries listed in Nos. **5.369** and **5.400**, the band 5 150-5 216 MHz is also allocated to the radiodetermination-satellite service (space-to-Earth) on a primary basis, subject to agreement obtained under No. **9.21**. In Region 2, the band is also allocated to the radiodetermination-satellite service (space-to-Earth) on a primary basis. In Regions 1 and 3, except those countries listed in Nos. **5.369** and **5.400**, the band is also allocated to the radiodetermination-satellite service (space-to-Earth) on a secondary basis. The use by the radiodetermination-satellite service is limited to feeder links in conjunction with the radiodetermination-satellite service operating in the bands 1610-1626.5 MHz and/or 2 483.5-2 500 MHz. The total power flux-density at the Earth's surface shall in no case exceed -159 dB(W/m²) in any 4 kHz band for all angles of arrival.

5.446A--The use of the bands 5 150-5 350 MHz and 5 470-5 725 MHz by the stations in the mobile service shall be in accordance with Resolution **229 (WRC-03)**. (WRC-03)

5.446B--In the band 5 150-5 250 MHz, stations in the mobile service shall not claim protection from

earth stations in the fixed-satellite service. No. **5.43A** does not apply to the mobile service with respect to fixed-satellite service earth stations. (WRC-03)

5.447--*Additional allocation:* in Israel, Lebanon, Pakistan, the Syrian Arab Republic and Tunisia, the band 5 150-5 250 MHz is also allocated to the mobile service, on a primary basis, subject to agreement obtained under No. **9.21**. In this case, the provisions of Resolution **229 (WRC-03)** do not apply. (WRC-03)

5.447A--The allocation to the fixed-satellite service (Earth-to-space) is limited to feeder links of non-geostationary-satellite systems in the mobile-satellite service and is subject to coordination under No. **9.11A**.

5.447B--*Additional allocation:* the band 5 150-5 216 MHz is also allocated to the fixed-satellite service (space-to-Earth) on a primary basis. This allocation is limited to feeder links of non-geostationary-satellite systems in the mobile-satellite service and is subject to provisions of No. **9.11A**. The power flux-density at the Earth's surface produced by space stations of the fixed-satellite service operating in the space-to-Earth direction in the band 5 150-5 216 MHz shall in no case exceed –164 dB(W/m²) in any 4 kHz band for all angles of arrival.

5.447C--Administrations responsible for fixed-satellite service networks in the band 5 150-5 250 MHz operated under Nos. **5.447A** and **5.447B** shall coordinate on an equal basis in accordance with No. **9.11A** with administrations responsible for non-geostationary-satellite networks operated under No. **5.446** and brought into use prior to 17 November 1995. Satellite networks operated under No. **5.446** brought into use after 17 November 1995 shall not claim protection from, and shall not cause harmful interference to, stations of the fixed-satellite service operated under Nos. **5.447A** and **5.447B**.

5.447D--The allocation of the band 5 250-5 255 MHz to the space research service on a primary basis is limited to active spaceborne sensors. Other uses of the band by the space research service are on a secondary basis.

5.447E--*Additional allocation:* The band 5 250-5 350 MHz is also allocated to the fixed service on a primary basis in the following countries in Region 3: Australia, Korea (Rep. of), India, Indonesia, Iran (Islamic Republic of), Japan, Malaysia, Papua New Guinea, Philippines, Sri Lanka, Thailand and Viet Nam. The use of this band by the fixed service is intended for the implementation of fixed wireless access (FWA) systems and shall comply with Recommendation ITU-R F.1613. In addition, the fixed service shall not claim protection from the radiodetermination, Earth exploration-satellite (active) and space research (active) services, but the provisions of No. **5.43A** do not apply to the fixed service with respect to the Earth exploration-satellite (active) and space research (active) services. After implementation of FWA systems in the fixed service with protection for the existing radiodetermination systems, no more stringent constraints should be imposed on the FWA systems by future radiodetermination implementations. (WRC-03)

5.447F--In the band 5 250-5 350 MHz, stations in the mobile service shall not claim protection from the radiolocation service, the Earth exploration-satellite service (active) and the space research service (active). These services shall not impose on the mobile service more stringent protection criteria, based on system characteristics and interference criteria, than those stated in Recommendations ITU-R M.1638 and ITU-R SA.1632. (WRC-03)

5.448--*Additional allocation:* in Azerbaijan, Libyan Arab Jamahiriya, Mongolia, Kyrgyzstan, Slovakia, Romania and Turkmenistan, the band 5 250-5 350 MHz is also allocated to the radionavigation service on a primary basis. (WRC-03)

5.448A--The Earth exploration-satellite (active) and space research (active) services in the frequency band 5 250-5 350 MHz shall not claim protection from the radiolocation service. No. **5.43A** does not apply. (WRC-03)

5.448B--The Earth exploration-satellite service (active) operating in the band 5 350-5 570 MHz and space research service (active) operating in the band 5 460-5 570 MHz shall not cause harmful interference to the aeronautical radionavigation service in the band 5 350-5 460 MHz, the radionavigation service in the band 5 460-5 470 MHz and the maritime radionavigation service in the band 5 470-5 570 MHz. (WRC-03)

5.448C--The space research service (active) operating in the band 5 350-5 460 MHz shall not cause harmful interference to nor claim protection from other services to which this band is allocated. (WRC-03)
5.448D--In the frequency band 5 350-5 470 MHz, stations in the radiolocation service shall not cause harmful interference to, nor claim protection from, radar systems in the aeronautical radionavigation service operating in accordance with No. **5.449**. (WRC-03)
5.449--The use of the band 5350-5470 MHz by the aeronautical radionavigation service is limited to airborne radars and associated airborne beacons.
5.450--*Additional allocation:* in Austria, Azerbaijan, Iran (Islamic Republic of), Mongolia, Kyrgyzstan, Romania, Turkmenistan and Ukraine, the band 5 470-5 650 MHz is also allocated to the aeronautical radionavigation service on a primary basis. (WRC-03)
5.450A--In the band 5 470-5 725 MHz, stations in the mobile service shall not claim protection from radiodetermination services. Radiodetermination services shall not impose on the mobile service more stringent protection criteria, based on system characteristics and interference criteria, than those stated in Recommendation ITU-R M.1638. (WRC-03)
5.450B--In the frequency band 5 470-5 650 MHz, stations in the radiolocation service, except ground-based radars used for meteorological purposes in the band 5 600-5 650 MHz, shall not cause harmful interference to, nor claim protection from, radar systems in the maritime radionavigation service. (WRC-03)
5.451--*Additional allocation:* in the United Kingdom, the band 5 470-5 850 MHz is also allocated to the land mobile service on a secondary basis. The power limits specified in Nos. **21.2, 21.3, 21.4** and **21.5** shall apply in the band 5 725-5 850 MHz.
5.452--Between 5 600 MHz and 5 650 MHz, ground-based radars used for meteorological purposes are authorized to operate on a basis of equality with stations of the maritime radionavigation service.
5.453--*Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Korea (Rep. of), Côte d'Ivoire, Egypt, the United Arab Emirates, Gabon, Guinea, Equatorial Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kenya, Kuwait, Lebanon, the Libyan Arab Jamahiriya, Madagascar, Malaysia, Nigeria, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Sri Lanka, Swaziland, Tanzania, Chad, Thailand, Togo, Viet Nam and Yemen, the band 5 650-5 850 MHz is also allocated to the fixed and mobile services on a primary basis. In this case, the provisions of Resolution **229 (WRC 03)** do not apply. (WRC-03)
5.454--*Different category of service:* in Azerbaijan, Georgia, Mongolia, Uzbekistan, Kyrgyzstan, the Russian Federation, Tajikistan and Turkmenistan, the allocation of the band 5 670-5 725 MHz to the space research service is on a primary basis (see No. **5.33**). (WRC-03)
5.455--*Additional allocation:* in Armenia, Azerbaijan, Belarus, Cuba, the Russian Federation, Georgia, Hungary, Kazakhstan, Latvia, Moldova, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan and Ukraine, the band 5 670-5 850 MHz is also allocated to the fixed service on a primary basis. (WRC-03)
5.456--*Additional allocation:* in Cameroon, the band 5 755-5 850 MHz is also allocated to the fixed service on a primary basis. (WRC-03)
5.457A--In the bands 5 925-6 425 MHz and 14-14.5 GHz, earth stations located on board vessels may communicate with space stations of the fixed-satellite service. Such use shall be in accordance with Resolution **902 (WRC-03)**. (WRC-03)
5.457B--In the bands 5 925-6 425 MHz and 14-14.5 GHz, earth stations located on board vessels may operate with the characteristics and under the conditions contained in Resolution **902 (WRC-03)** in Algeria, Saudi Arabia, Bahrain, Comoros, Djibouti, Egypt, United Arab Emirates, Jordan, Kuwait, Libyan Arab Jamahiriya, Morocco, Mauritania, Oman, Qatar, Syrian Arab Republic, Sudan, Tunisia and Yemen, in the maritime mobile-satellite service on a secondary basis. Such use shall be in accordance with Resolution **902 (WRC-03)**. (WRC-03)

5.458--In the band 6 425-7 075 MHz, passive microwave sensor measurements are carried out over the oceans. In the band 7 075-7 250 MHz, passive microwave sensor measurements are carried out. Administrations should bear in mind the needs of the Earth exploration-satellite (passive) and space research (passive) services in their future planning of the bands 6 425-7 025 MHz and 7 075-7 250 MHz.

5.458A--In making assignments in the band 6 700-7 075 MHz to space stations of the fixed-satellite service, administrations are urged to take all practicable steps to protect spectral line observations of the radio astronomy service in the band 6 650-6 675.2 MHz from harmful interference from unwanted emissions.

5.458B--The space-to-Earth allocation to the fixed-satellite service in the band 6 700-7 075 MHz is limited to feeder links for non-geostationary satellite systems of the mobile-satellite service and is subject to coordination under No. **9.11A**. The use of the band 6 700-7 075 MHz (space-to-Earth) by feeder links for non-geostationary satellite systems in the mobile-satellite service is not subject to No. **22.2**.

5.458C--Administrations making submissions in the band 7 025-7 075 MHz (Earth-to-space) for geostationary-satellite systems in the fixed-satellite service after 17 November 1995 shall consult on the basis of relevant ITU-R Recommendations with the administrations that have notified and brought into use non-geostationary-satellite systems in this frequency band before 18 November 1995 upon request of the latter administrations. This consultation shall be with a view to facilitating shared operation of both geostationary-satellite systems in the fixed-satellite service and non-geostationary-satellite systems in this band.

5.459--*Additional allocation:* in Russian Federation, the frequency bands 7 100-7 155 MHz and 7 190-7 235 MHz are also allocated to the space operation service (Earth-to-space) on a primary basis, subject to agreement obtained under No. **9.21**.

5.460--The use of the band 7 145-7 190 MHz by the space research service (Earth-to-space) is restricted to deep space; no emissions to deep space shall be effected in the band 7 190-7 235 MHz. Geostationary satellites in the space research service operating in the band 7 190-7 235 MHz shall not claim protection from existing and future stations of the fixed and mobile services and No. **5.43A** does not apply. (WRC-03)

5.461--*Additional allocation:* the bands 7 250-7 375 MHz (space-to-Earth) and 7 900-8 025 MHz (Earth-to-space) are also allocated to the mobile-satellite service on a primary basis, subject to agreement obtained under No. **9.21**.

5.461A--The use of the band 7 450-7 550 MHz by the meteorological-satellite service (space-to-Earth) is limited to geostationary-satellite systems. Non-geostationary meteorological-satellite systems in this band notified before 30 November 1997 may continue to operate on a primary basis until the end of their lifetime.

5.461B--The use of the band 7 750-7 850 MHz by the meteorological-satellite service (space-to-Earth) is limited to non-geostationary satellite systems.

5.462A--In Regions 1 and 3 (except for Japan), in the band 8 025-8 400 MHz, the earth exploration-satellite service using geostationary satellites shall not produce a power flux-density in excess of the following provisional values for angles of arrival (θ), without the consent of the affected administration:

– 174 dB(W/m²) in a 4 kHz band	for $0° \le \theta < 5°$
– 174 + 0.5 (θ – 5) dB(W/m²) in a 4 kHz band	for $5° \le \theta < 25°$
– 164 dB(W/m²) in a 4 kHz band	for $25° \le \theta \le 90°$

These values are subject to study under Resolution **124 (WRC-97)**[5].

5.463--Aircraft stations are not permitted to transmit in the band 8 025-8 400 MHz.

5.465--In the space research service, the use of the band 8 400-8 450 MHz is limited to deep space.

5.466--*Different category of service:* in Israel, Singapore and Sri Lanka, the allocation of the band

5. Note by the Secretariat: This Resolution was revised by WRC-2000.

8 400-8 500 MHz to the space research service is on a secondary basis (see No. **5.32**). (WRC-03)

5.467--(Suppressed by WRC-03)

5.468--*Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Burundi, Cameroon, China, Congo (Rep. of the), Costa Rica, Egypt, the United Arab Emirates, Gabon, Guyana, Indonesia, Iran (Islamic Republic of), Iraq, Jamaica, Jordan, Kenya, Kuwait, Lebanon, Libyan Arab Jamahiriya, Malaysia, Mali, Morocco, Mauritania, Nepal, Nigeria, Oman, Pakistan, Qatar, Syrian Arab Republic, Dem. People's Rep. of Korea, Senegal, Singapore, Somalia, Swaziland, Tanzania, Chad, Togo, Tunisia and Yemen, the band 8 500 8 750 MHz is also allocated to the fixed and mobile services on a primary basis. (WRC-03)

5.469--*Additional allocation:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Hungary, Lithuania, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, the Czech Rep., Romania, Tajikistan, Turkmenistan and Ukraine, the band 8 500-8 750 MHz is also allocated to the land mobile and radionavigation services on a primary basis. (WRC-03)

5.469A--In the band 8 550-8 650 MHz, stations in the earth exploration-satellite service (active) and space research service (active) shall not cause harmful interference to, or constrain the use and development of, stations of the radiolocation service.

5.470--The use of the band 8 750-8 850 MHz by the aeronautical radionavigation service is limited to airborne Doppler navigation aids on a centre frequency of 8 800 MHz.

5.471--*Additional allocation:* in Algeria, Germany, Bahrain, Belgium, China, the United Arab Emirates, France, Greece, Indonesia, Iran (Islamic Republic of), Libya, the Netherlands, Qatar and Sudan, the bands 8 825-8 850 MHz and 9 000-9 200 MHz are also allocated to the maritime radionavigation service, on a primary basis, for use by shore-based radars only.

5.472--In the bands 8 850-9 000 MHz and 9 200-9 225 MHz, the maritime radionavigation service is limited to shore-based radars.

5.473--*Additional allocation:* in Armenia, Austria, Azerbaijan, Belarus, Bulgaria, Cuba, the Russian Federation, Georgia, Hungary, Moldova, Mongolia, Uzbekistan, Poland, Kyrgyzstan, Romania, Tajikistan, Turkmenistan and Ukraine, the bands 8 850-9 000 MHz and 9 200-9 300 MHz are also allocated to the radionavigation service on a primary basis. (WRC-03)

5.474--In the band 9 200-9 500 MHz, search and rescue transponders (SART) may be used, having due regard to the appropriate ITU-R Recommendation (see also Article **31**).

5.475--The use of the band 9 300-9 500 MHz by the aeronautical radionavigation service is limited to airborne weather radars and ground-based radars. In addition, ground-based radar beacons in the aeronautical radionavigation service are permitted in the band 9 300-9 320 MHz on condition that harmful interference is not caused to the maritime radionavigation service. In the band 9 300-9 500 MHz, ground-based radars used for meteorological purposes have priority over other radiolocation devices.

5.476--In the band 9 300-9 320 MHz in the radionavigation service, the use of shipborne radars, other than those existing on 1 January 1976, is not permitted until 1 January 2001.

5.476A--In the band 9 500-9 800 MHz, stations in the earth exploration-satellite service (active) and space research service (active) shall not cause harmful interference to, or constrain the use and development of, stations of the radionavigation and radiolocation services.

5.477--*Different category of service:* in Algeria, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Guyana, India, Indonesia, Iran (Islamic Republic of), Iraq, Jamaica, Japan, Jordan, Kuwait, Lebanon, Liberia, Malaysia, Nigeria, Oman, Pakistan, Qatar, the Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, Trinidad and Tobago, and Yemen, the allocation of the band 9 800-10 000 MHz to the fixed service is on a primary basis (see No. **5.33**). (WRC-03)

5.478--*Additional allocation:* in Azerbaijan, Bulgaria, Mongolia, Kyrgyzstan, Romania, Turkmenistan and Ukraine, the band 9 800-10 000 MHz is also allocated to the radionavigation service on a primary basis. (WRC-03)

5.479--The band 9 975-10 025 MHz is also allocated to the meteorological-satellite service on a secondary basis for use by weather radars.

5.480--*Additional allocation:* in Argentina, Brazil, Chile, Costa Rica, Cuba, El Salvador, Ecuador, Guatemala, Honduras, Mexico, Paraguay, Peru, Uruguay and Venezuela, the band 10-10.45 GHz is also allocated to the fixed and mobile services on a primary basis.

5.481--*Additional allocation:* in Germany, Angola, Brazil, China, Costa Rica, Côte d'Ivoire, El Salvador, Ecuador, Spain, Guatemala, Hungary, Japan, Kenya, Morocco, Nigeria, Oman, Uzbekistan, Paraguay, Peru, the Dem. People's Rep. of Korea, Tanzania, Thailand and Uruguay, the band 10.45-10.5 GHz is also allocated to the fixed and mobile services on a primary basis (WRC-03)

5.482--In the band 10.6-10.68 GHz, stations of the fixed and mobile, except aeronautical mobile, services shall be limited to a maximum equivalent isotropically radiated power of 40 dBW and the power delivered to the antenna shall not exceed -3 dBW. These limits may be exceeded subject to agreement obtained under No. **9.21**. However, in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Bangladesh, Belarus, China, the United Arab Emirates, Georgia, India, Indonesia, Iran (Islamic Republic of), Iraq, Japan, Kazakhstan, Kuwait, Latvia, Lebanon, Moldova, Nigeria, Pakistan, the Philippines, Qatar, Syrian Arab Republic, Tajikistan and Turkmenistan, the restrictions on the fixed and mobile, except aeronautical mobile, services are not applicable. (WRC-03)

5.483--*Additional allocation:* in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Bosnia and Herzegovina, China, Colombia, Korea (Rep. of), Costa Rica, Egypt, the United Arab Emirates, Georgia, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kazakhstan, Kuwait, Lebanon, Mongolia, Uzbekistan, Qatar, Kyrgyzstan, the Dem. People's Rep. of Korea, Romania, Serbia and Montenegro, Tajikistan, Turkmenistan and Yemen, the band 10.68-10.7 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. Such use is limited to equipment in operation by 1 January 1985. (WRC-03)

5.484--In Region 1, the use of the band 10.7-11.7 GHz by the fixed-satellite service (Earth-to-space) is limited to feeder links for the broadcasting-satellite service.

5.484A--The use of the bands 10.95-11.2 GHz (space-to-Earth), 11.45-11.7 GHz (space-to-Earth), 11.7-12.2 GHz (space-to-Earth) in Region 2, 12.2-12.75 GHz (space-to-Earth) in Region 3, 12.5-12.75 GHz (space-to-Earth) in Region 1, 13.75-14.5 GHz (Earth-to-space), 17.8-18.6 GHz (space-to-Earth), 19.7-20.2 GHz (space-to-Earth), 27.5-28.6 GHz (Earth-to-space), 29.5-30 GHz (Earth-to-space) by a non-geostationary-satellite system in the fixed-satellite service is subject to application of the provisions of No. **9.12** for coordination with other non-geostationary-satellite systems in the fixed-satellite service. Non-geostationary-satellite systems in the fixed-satellite service shall not claim protection from geostationary-satellite networks in the fixed-satellite service operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the Bureau of the complete coordination or notification information, as appropriate, for the non-geostationary-satellite systems in the fixed-satellite service and of the complete coordination or notification information, as appropriate, for the geostationary-satellite networks, and No. 5.43A does not apply. Non-geostationary-satellite systems in the fixed-satellite service in the above bands shall be operated in such a way that any unacceptable interference that may occur during their operation shall be rapidly eliminated.

5.485 In Region 2, in the band 11.7-12.2 GHz, transponders on space stations in the fixed-satellite service may be used additionally for transmissions in the broadcasting-satellite service, provided that such transmissions do not have a maximum e.i.r.p. greater than 53 dBW per television channel and do not cause greater interference or require more protection from interference than the coordinated fixed-satellite service frequency assignments. With respect to the space services, this band shall be used principally for the fixed-satellite service.

5.486--*Different category of service:* in Mexico and the United States, the allocation of the band 11.7-12.1 GHz to the fixed service is on a secondary basis (see No. **5.32**).

5.487--In the band 11.7-12.5 GHz in Regions 1 and 3, the fixed, fixed-satellite, mobile, except aeronau-

tical mobile, and broadcasting services, in accordance with their respective allocations, shall not cause harmful interference to, or claim protection from, broadcasting-satellite stations operating in accordance with the Regions 1 and 3 Plan in Appendix **30**. (WRC-03)

5.487A--*Additional allocation:* in Region 1, the band 11.7-12.5 GHz, in Region 2, the band 12.2-12.7 GHz and, in Region 3, the band 11.7-12.2 GHz, are also allocated to the fixed-satellite service (space-to-Earth) on a primary basis, limited to non-geostationary systems and subject to application of the provisions of No. **9.12** for coordination with other non-geostationary-satellite systems in the fixed-satellite service. Non-geostationary-satellite systems in the fixed-satellite service shall not claim protection from geostationary-satellite networks in the broadcasting-satellite service operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the Bureau of the complete coordination or notification information, as appropriate, for the non-geostationary-satellite systems in the fixed-satellite service and of the complete coordination or notification information, as appropriate, for the geostationary-satellite networks, and No. **5.43A** does not apply. Non-geostationary-satellite systems in the fixed-satellite service in the above bands shall be operated in such a way that any unacceptable interference that may occur during their operation shall be rapidly eliminated. (WRC-03)

5.488--The use of the band 11.7-12.2 GHz by geostationary-satellite networks in the fixed-satellite service in Region 2 is subject to application of the provisions of No. **9.14** for coordination with stations of terrestrial services in Regions 1, 2 and 3. For the use of the band 12.2-12.7 GHz by the broadcasting-satellite service in Region 2, see Appendix **30**. (WRC-03)

5.489--*Additional allocation:* in Peru, the band 12.1-12.2 GHz is also allocated to the fixed service on a primary basis.

5.490--In Region 2, in the band 12.2-12.7 GHz, existing and future terrestrial radiocommunication services shall not cause harmful interference to the space services operating in conformity with the broadcasting-satellite Plan for Region 2 contained in Appendix **30**.

5.491--(Suppressed by WRC-03)

5.492--Assignments to stations of the broadcasting-satellite service which are in conformity with the appropriate regional Plan or included in the Regions 1 and 3 List in Appendix **30** may also be used for transmissions in the fixed-satellite service (space-to-Earth), provided that such transmissions do not cause more interference, or require more protection from interference, than the broadcasting-satellite service transmissions operating in conformity with the Plan or the List, as appropriate.

5.493--The broadcasting-satellite service in the band 12.5-12.75 GHz in Region 3 is limited to a power flux-density not exceeding –111 dB(W/(m^2 · 27 MHz)) for all conditions and for all methods of modulation at the edge of the service area.

5.494--*Additional allocation:* in Algeria, Angola, Saudi Arabia, Bahrain, Cameroon, the Central African Rep., Congo (Rep. of the), Côte d'Ivoire, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Gabon, Ghana, Guinea, Iraq, Israel, Jordan, Kuwait, Lebanon, Libyan Arab Jamahiriya, Madagascar, Mali, Morocco, Mongolia, Nigeria, Qatar, Syrian Arab Republic, Dem. Rep. of the Congo, Somalia, Sudan, Chad, Togo and Yemen, the band 12.5-12.75 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis. (WRC-03)

5.495--*Additional allocation:* in Bosnia and Herzegovina, Croatia, France, Greece, Liechtenstein, Monaco, Uganda, Portugal, Romania, Serbia and Montenegro, Slovenia, Switzerland, Tanzania and Tunisia, the band 12.5 12.75 GHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a secondary basis. (WRC-03)

5.496--*Additional allocation:* in Austria, Azerbaijan, Kyrgyzstan and Turkmenistan, the band 12.5-12.75 GHz is also allocated to the fixed service and the mobile, except aeronautical mobile, service on a primary basis. However, stations in these services shall not cause harmful interference to fixed-satellite service earth stations of countries in Region 1 other than those listed in this footnote. Coordination of these earth stations is not required with stations of the fixed and mobile services of the countries listed in this footnote. The power flux-density limit at the Earth's surface given in Table 21-4 of Article **21**, for

the fixed-satellite service shall apply on the territory of the countries listed in this footnote.

5.497--The use of the band 13.25-13.4 GHz by the aeronautical radionavigation service is limited to Doppler navigation aids.

5.498A--The Earth exploration-satellite (active) and space research (active) services operating in the band 13.25-13.4 GHz shall not cause harmful interference to, or constrain the use and development of, the aeronautical radionavigation service.

5.499--*Additional allocation:* in Bangladesh, India and Pakistan, the band 13.25-14 GHz is also allocated to the fixed service on a primary basis.

5.500--*Additional allocation:* in Algeria, Angola, Saudi Arabia, Bahrain, Brunei Darussalam, Cameroon, Egypt, the United Arab Emirates, Gabon, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kuwait, Lebanon, Madagascar, Malaysia, Mali, Malta, Morocco, Mauritania, Nigeria, Pakistan, Qatar, Syrian Arab Republic, Singapore, Sudan, Chad and Tunisia, the band 13.4-14 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-03)

5.501--*Additional allocation:* in Azerbaijan, Hungary, Japan, Mongolia, Kyrgyzstan, Romania, the United Kingdom and Turkmenistan, the band 13.4-14 GHz is also allocated to the radionavigation service on a primary basis. (WRC-03)

5.501A--The allocation of the band 13.4-13.75 GHz to the space research service on a primary basis is limited to active spaceborne sensors. Other uses of the band by the space research service are on a secondary basis.

5.501B--In the band 13.4-13.75 GHz, the Earth exploration-satellite (active) and space research (active) services shall not cause harmful interference to, or constrain the use and development of, the radiolocation service.

5.502--In the band 13.75-14 GHz, an earth station of a geostationary fixed-satellite service network shall have a minimum antenna diameter of 1.2 m and an earth station of a non-geostationary fixed-satellite service system shall have a minimum antenna diameter of 4.5 m. In addition, the e.i.r.p., averaged over one second, radiated by a station in the radiolocation or radionavigation services shall not exceed 59 dBW for elevation angles above 2° and 65 dBW at lower angles. Before an administration brings into use an earth station in a geostationary-satellite network in the fixed-satellite service in this band with an antenna size smaller than 4.5 m, it shall ensure that the power flux-density produced by this earth station does not exceed:

– –115 dB(W/(m² · 10 MHz)) for more than 1% of the time produced at 36 m above sea level at the low water mark, as officially recognized by the coastal state;

– –115 dB(W/(m² · 10 MHz)) for more than 1% of the time produced 3 m above ground at the border of the territory of an administration deploying or planning to deploy land mobile radars in this band, unless prior agreement has been obtained.

For earth stations within the fixed-satellite service having an antenna diameter greater than or equal to 4.5 m, the e.i.r.p. of any emission should be at least 68 dBW and should not exceed 85 dBW. (WRC-03)

5.503--In the band 13.75-14 GHz, geostationary space stations in the space research service for which information for advance publication has been received by the Bureau prior to 31 January 1992 shall operate on an equal basis with stations in the fixed-satellite service; after that date, new geostationary space stations in the space research service will operate on a secondary basis. Until those geostationary space stations in the space research service for which information for advance publication has been received by the Bureau prior to 31 January 1992 cease to operate in this band:

– in the band 13.77-13.78 GHz, the e.i.r.p. density of emissions from any earth station in the fixed-satellite service operating with a space station in geostationary-satellite orbit shall not exceed:

i) $4.7D + 28$ dB(W/40 kHz), where D is the fixed-satellite service earth station antenna diameter (m) for antenna diameters equal to or greater than 1.2 m and less than 4.5 m;

ii) $49.2 + 20 \log(D/4.5)$ dB(W/40 kHz), where D is the fixed-satellite service earth station antenna diameter (m) for antenna diameters equal to or greater than 4.5 m and less than 31.9 m;

iii) 66.2 dB(W/40 kHz) for any fixed-satellite service earth station for antenna diameters (m) equal to or greater than 31.9 m;

iv) 56.2 dB(W/4 kHz) for narrow-band (less than 40 kHz of necessary bandwidth) fixed-satellite service earth station emissions from any fixed-satellite service earth station having an antenna diameter of 4.5 m or greater;

– the e.i.r.p. density of emissions from any earth station in the fixed-satellite service operating with a space station in non-geostationary-satellite orbit shall not exceed 51 dBW in the 6 MHz band from 13.772 to 13.778 GHz.

Automatic power control may be used to increase the e.i.r.p. density in these frequency ranges to compensate for rain attenuation, to the extent that the power flux-density at the fixed-satellite service space station does not exceed the value resulting from use by an earth station of an e.i.r.p. meeting the above limits in clear-sky conditions. (WRC-03)

5.503A--(Suppressed by WRC-03)

5.504--The use of the band 14-14.3 GHz by the radionavigation service shall be such as to provide sufficient protection to space stations of the fixed-satellite service.

5.504A--In the band 14-14.5 GHz, aircraft earth stations in the secondary aeronautical mobile-satellite service may also communicate with space stations in the fixed-satellite service. The provisions of Nos. **5.29**, **5.30** and **5.31** apply. (WRC-03)

5.504B--Aircraft earth stations operating in the aeronautical mobile-satellite service in the band 14-14.5 GHz shall comply with the provisions of Annex 1, Part C of Recommendation ITU-R M.1643, with respect to any radio astronomy station performing observations in the 14.47-14.5 GHz band located on the territory of Spain, France, India, Italy, the United Kingdom and South Africa. (WRC-03)

5.504C--In the band 14-14.25 GHz, the power flux-density produced on the territory of the countries of Saudi Arabia, Botswana, Côte d'Ivoire, Egypt, Guinea, India, Iran, Kuwait, Lesotho, Nigeria, Oman, Syrian Arab Republic and Tunisia by any aircraft earth station in the aeronautical mobile-satellite service shall not exceed the limits given in Annex 1, Part B of Recommendation ITU-R M.1643, unless otherwise specifically agreed by the affected administration(s). The provisions of this footnote in no way derogate the obligations of the aeronautical mobile-satellite service to operate as a secondary service in accordance with No. **5.29**. (WRC-03)

5.505--*Additional allocation:* in Algeria, Angola, Saudi Arabia, Bahrain, Bangladesh, Botswana, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Korea (Rep. of), Egypt, the United Arab Emirates, Gabon, Guatemala, Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Lesotho, Lebanon, Malaysia, Mali, Morocco, Mauritania, Oman, Pakistan, the Philippines, Qatar, Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, Swaziland, Tanzania, Chad and Yemen, the band 14-14.3 GHz is also allocated to the fixed service on a primary basis. (WRC-03)

5.506--The band 14-14.5 GHz may be used, within the fixed-satellite service (Earth-to-space), for feeder links for the broadcasting-satellite service, subject to coordination with other networks in the fixed-satellite service. Such use of feeder links is reserved for countries outside Europe.

5.506A--In the band 14-14.5 GHz, ship earth stations with an e.i.r.p. greater than 21 dBW shall operate under the same conditions as earth stations located on board vessels, as provided in Resolution **902 (WRC-03)**. This footnote shall not apply to ship earth stations for which the complete Appendix **4** information has been received by the Radiocommunication Bureau prior to 5 July 2003. (WRC-03)

5.506B--Earth stations located on board vessels communicating with space stations in the fixed-satellite service may operate in the frequency band 14-14.5 GHz without the need for prior agreement from Cyprus, Greece and Malta, within the minimum distance given in Resolution **902 (WRC-03)** from these countries. (WRC-03)

5.508--*Additional allocation:* in Germany, Bosnia and Herzegovina, France, Italy, The Former Yugoslav Rep. of Macedonia, Libyan Arab Jamahiriya, the United Kingdom, Serbia and Montenegro and

Slovenia, the band 14.25-14.3 GHz is also allocated to the fixed service on a primary basis. (WRC-03)

5.508A--In the band 14.25-14.3 GHz, the power flux-density produced on the territory of the countries of Saudi Arabia, Botswana, China, Côte d'Ivoire, Egypt, France, Guinea, India, Iran (Islamic Republic of), Italy, Kuwait, Lesotho, Nigeria, Oman, Syrian Arab Republic, the United Kingdom and Tunisia by any aircraft earth station in the aeronautical mobile-satellite service shall not exceed the limits given in Annex 1, Part B of Recommendation ITU R M.1643, unless otherwise specifically agreed by the affected administration(s). The provisions of this footnote in no way derogate the obligations of the aeronautical mobile-satellite service to operate as a secondary service in accordance with No. **5.29**. (WRC-03)

5.509--*Additional allocation:* in Japan the band 14.25-14.3 GHz is also allocated to the mobile, except aeronautical mobile, service on a primary basis.

5.509A--In the band 14.3-14.5 GHz, the power flux-density produced on the territory of the countries of Saudi Arabia, Botswana, Cameroon, China, Côte d'Ivoire, Egypt, France, Gabon, Guinea, India, Iran (Islamic Republic of), Italy, Kuwait, Lesotho, Morocco, Nigeria, Oman, Syrian Arab Republic, the United Kingdom, Sri Lanka, Tunisia and Viet Nam by any aircraft earth station in the aeronautical mobile-satellite service shall not exceed the limits given in Annex 1, Part B of Recommendation ITU R M.1643, unless otherwise specifically agreed by the affected administration(s). The provisions of this footnote in no way derogate the obligations of the aeronautical mobile-satellite service to operate as a secondary service in accordance with No. **5.29**. (WRC-03)

5.510--The use of the band 14.5-14.8 GHz by the fixed-satellite service (Earth-to-space) is limited to feeder links for the broadcasting-satellite service. This use is reserved for countries outside Europe.

5.511--*Additional allocation:* in Saudi Arabia, Bahrain, Bosnia and Herzegovina, Cameroon, Egypt, the United Arab Emirates, Guinea, Iran (Islamic Republic of), Iraq, Israel, Kuwait, Lebanon, Libya, Pakistan, Qatar, Syria, Slovenia, Somalia and Yugoslavia, the band 15.35-15.4 GHz is also allocated to the fixed and mobile services on a secondary basis.

5.511A--The band 15.43-15.63 GHz is also allocated to the fixed-satellite service (space-to-Earth) on a primary basis. Use of the band 15.43-15.63 GHz by the fixed-satellite service (space-to-Earth and Earth-to-space) is limited to feeder links of non-geostationary systems in the mobile-satellite service, subject to coordination under No. **9.11A**. The use of the frequency band 15.43-15.63 GHz by the fixed-satellite service (space-to-Earth) is limited to feeder links of non-geostationary systems in the mobile-satellite service for which advance publication information has been received by the Bureau prior to 2 June 2000. In the space-to-Earth direction, the minimum earth station elevation angle above and gain towards the local horizontal plane and the minimum coordination distances to protect an earth station from harmful interference shall be in accordance with Recommendation ITU-R S.1341. In order to protect the radio astronomy service in the band 15.35-15.4 GHz, the aggregate power flux-density radiated in the 15.35-15.4 GHz band by all the space stations within any feeder-link of a non-geostationary system in the mobile-satellite service (space-to-Earth) operating in the 15.43-15.63 GHz band shall not exceed the level of -156 dB(W/m^2) in a 50 MHz bandwidth, into any radio astronomy observatory site for more than 2% of the time.

5.511C--Stations operating in the aeronautical radionavigation service shall limit the effective e.i.r.p. in accordance with Recommendation ITU-R S.1340. The minimum coordination distance required to protect the aeronautical radionavigation stations (No. **4.10** applies) from harmful interference from feeder-link earth stations and the maximum e.i.r.p. transmitted towards the local horizontal plane by a feeder-link earth station shall be in accordance with Recommendation ITU-R S.1340.

5.511D--Fixed-satellite service systems for which complete information for advance publication has been received by the Bureau by 21 November 1997 may operate in the bands 15.4-15.43 GHz and 15.63-15.7 GHz in the space-to-Earth direction and 15.63-15.65 GHz in the Earth-to-space direction. In the bands 15.4-15.43 GHz and 15.65-15.7 GHz, emissions from a non-geostationary space station shall not exceed the power flux-density limits at the Earth's surface of –146 dB(W/(m^2 · MHz)) for any angle of arrival. In the band 15.63-15.65 GHz, where an administration plans emissions from a non-geostationary

space station that exceed –146 dB(W/(m^2 · MHz)) for any angle of arrival, it shall coordinate under No. **9.11A** with the affected administrations. Stations in the fixed-satellite service operating in the band 15.63-15.65 GHz in the Earth-to-space direction shall not cause harmful interference to stations in the aeronautical radionavigation service (No. **4.10** applies).

5.512--*Additional allocation:* in Algeria, Angola, Saudi Arabia, Austria, Bahrain, Bangladesh, Bosnia and Herzegovina, Brunei Darussalam, Cameroon, Congo (Rep. of the), Costa Rica, Egypt, El Salvador, the United Arab Emirates, Eritrea, Finland, Guatemala, India, Indonesia, Iran (Islamic Republic of), Jordan, Kenya, Kuwait, Libyan Arab Jamahiriya, Malaysia, Mali, Morocco, Mauritania, Mozambique, Nepal, Nicaragua, Oman, Pakistan, Qatar, Serbia and Montenegro, Singapore, Slovenia, Somalia, Sudan, Swaziland, Tanzania, Chad, Togo and Yemen, the band 15.7-17.3 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-03)

5.513--*Additional allocation:* in Israel, the band 15.7-17.3 GHz is also allocated to the fixed and mobile services on a primary basis. These services shall not claim protection from or cause harmful interference to services operating in accordance with the Table in countries other than those included in No. **5.512**.

5.513A--Spaceborne active sensors operating in the band 17.2-17.3 GHz shall not cause harmful interference to, or constrain the development of, the radiolocation and other services allocated on a primary basis.

5.514--*Additional allocation:* in Algeria, Angola, Saudi Arabia, Austria, Bahrain, Bangladesh, Bosnia and Herzegovina, Cameroon, Costa Rica, El Salvador, the United Arab Emirates, Finland, Guatemala, India, Iran (Islamic Republic of), Iraq, Israel, Italy, Japan, Jordan, Kuwait, Libyan Arab Jamahiriya, Lithuania, Nepal, Nicaragua, Nigeria, Oman, Uzbekistan, Pakistan, Qatar, Kyrgyzstan, Serbia and Montenegro, Slovenia and Sudan, the band 17.3-17.7 GHz is also allocated to the fixed and mobile services on a secondary basis. The power limits given in Nos. **21.3** and **21.5** shall apply. (WRC-03)

5.515--In the band 17.3-17.8 GHz, sharing between the fixed-satellite service (Earth-to-space) and the broadcasting-satellite service shall also be in accordance with the provisions of § 1 of Annex 4 of Appendix **30A**.

5.516--The use of the band 17.3-18.1 GHz by geostationary-satellite systems in the fixed-satellite service (Earth-to-space) is limited to feeder links for the broadcasting-satellite service. The use of the band 17.3-17.8 GHz in Region 2 by systems in the fixed-satellite service (Earth-to-space) is limited to geostationary satellites. For the use of the band 17.3-17.8 GHz in Region 2 by feeder links for the broadcasting-satellite service in the band 12.2-12.7 GHz, see Article **11**. The use of the bands 17.3-18.1 GHz (Earth-to-space) in Regions 1 and 3 and 17.8-18.1 GHz (Earth-to-space) in Region 2 by non-geostationary-satellite systems in the fixed-satellite service is subject to application of the provisions of No. **9.12** for coordination with other non-geostationary-satellite systems in the fixed-satellite service. Non-geostationary-satellite systems in the fixed-satellite service shall not claim protection from geostationary-satellite networks in the fixed-satellite service operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the Bureau of the complete coordination or notification information, as appropriate, for the non-geostationary-satellite systems in the fixed-satellite service and of the complete coordination or notification information, as appropriate, for the geostationary-satellite networks, and No. **5.43A** does not apply. Non-geostationary-satellite systems in the fixed-satellite service in the above bands shall be operated in such a way that any unacceptable interference that may occur during their operation shall be rapidly eliminated.

5.516A--In the band 17.3-17.7 GHz, earth stations of the fixed-satellite service (space-to-Earth) in Region 1 shall not claim protection from the broadcasting-satellite service feeder-link earth stations operating under Appendix **30A**, nor put any limitations or restrictions on the locations of the broadcasting-satellite service feeder-link earth stations anywhere within the service area of the feeder link. (WRC-03)

5.516B--The following bands are identified for use by high-density applications in the fixed-satellite service (HDFSS):

17.3-17.7 GHz (space-to-Earth) in Region 1

18.3-19.3 GHz (space-to-Earth) in Region 2
19.7-20.2 GHz (space-to-Earth) in all Regions
39.5-40 GHz (space-to-Earth) in Region 1
40-40.5 GHz (space-to-Earth) in all Regions
40.5-42 GHz (space-to-Earth) in Region 2
47.5-47.9 GHz (space-to-Earth) in Region 1
48.2-48.54 GHz (space-to-Earth) in Region 1
49.44-50.2 GHz (space-to-Earth) in Region 1
and
27.5-27.82 GHz (Earth-to-space) in Region 1
28.35-28.45 GHz (Earth-to-space) in Region 2
28.45-28.94 GHz (Earth-to-space) in all Regions
28.94-29.1 GHz (Earth-to-space) in Region 2 and 3
29.25-29.46 GHz (Earth-to-space) in Region 2
29.46-30 GHz (Earth-to-space) in all Regions
48.2-50.2 GHz (Earth-to-space) in Region 2

This identification does not preclude the use of these bands by other fixed-satellite service applications or by other services to which these bands are allocated on a co-primary basis and does not establish priority in these Regulations among users of the bands. Administrations should take this into account when considering regulatory provisions in relation to these bands. See Resolution **143 (WRC-03)**. (WRC-03)

5.517--In Region 2, the allocation to the broadcasting-satellite service in the band 17.3-17.8 GHz shall come into effect on 1 April 2007. After that date, use of the fixed-satellite (space-to-Earth) service in the band 17.7-17.8 GHz shall not claim protection from and shall not cause harmful interference to operating systems in the broadcasting-satellite service.

5.518--*Different category of service:* in Region 2, the allocation of the band 17.7-17.8 GHz to the mobile service is on a primary basis until 31 March 2007.

5.519--*Additional allocation:* the band 18.1-18.3 GHz is also allocated to the meteorological-satellite service (space-to-Earth) on a primary basis. Its use is limited to geostationary satellites and shall be in accordance with the provisions of Article **21**, Table 21-4.

5.520--The use of the band 18.1-18.4 GHz by the fixed-satellite service (Earth-to-space) is limited to feeder links of geostationary-satellite systems in the broadcasting-satellite service.

5.521--*Alternative allocation:* in Germany, Denmark, the United Arab Emirates and Greece, the band 18.1-18.4 GHz is allocated to the fixed, fixed-satellite (space-to-Earth) and mobile services on a primary basis (see No. **5.33**). The provisions of No. **5.519** also apply. (WRC-03)

5.522A--The emissions of the fixed service and the fixed-satellite service in the band 18.6-18.8 GHz are limited to the values given in Nos. **21.5A** and **21.16.2**, respectively.

5.522B--The use of the band 18.6-18.8 GHz by the fixed-satellite service is limited to geostationary systems and systems with an orbit of apogee greater than 20000 km.

5.522C--In the band 18.6-18.8 GHz, in Algeria, Saudi Arabia, Bahrain, Egypt, the United Arab Emirates, Jordan, Lebanon, Libya, Morocco, Oman, Qatar, Syria, Tunisia and Yemen, fixed-service systems in operation at the date of entry into force of the Final Acts of WRC-2000 are not subject to the limits of No. **21.5A**.

5.523A--The use of the bands 18.8-19.3 GHz (space-to-Earth) and 28.6-29.1 GHz (Earth-to-space) by geostationary and non-geostationary fixed-satellite service networks is subject to the application of the provisions of No. **9.11A** and No. **22.2** does not apply. Administrations having geostationary-satellite networks under coordination prior to 18 November 1995 shall cooperate to the maximum extent possible to coordinate pursuant to No. **9.11A** with non-geostationary-satellite networks for which notification information has been received by the Bureau prior to that date, with a view to reaching results acceptable to all

the parties concerned. Non-geostationary-satellite networks shall not cause unacceptable interference to geostationary fixed-satellite service networks for which complete Appendix **4** notification information is considered as having been received by the Bureau prior to 18 November 1995.

5.523B--The use of the band 19.3-19.6 GHz (Earth-to-space) by the fixed-satellite service is limited to feeder links for non-geostationary-satellite systems in the mobile-satellite service. Such use is subject to the application of the provisions of No. **9.11A**, and No. **22.2** does not apply.

5.523C--No. **22.2** shall continue to apply in the bands 19.3-19.6 GHz and 29.1-29.4 GHz, between feeder links of non-geostationary mobile-satellite service networks and those fixed-satellite service networks for which complete Appendix **4** coordination information, or notification information, is considered as having been received by the Bureau prior to 18 November 1995.

5.523D--The use of the band 19.3-19.7 GHz (space-to-Earth) by geostationary fixed-satellite service systems and by feeder links for non-geostationary-satellite systems in the mobile-satellite service is subject to the application of the provisions of No. **9.11A**, but not subject to the provisions of No. **22.2**. The use of this band for other non-geostationary fixed-satellite service systems, or for the cases indicated in Nos. **5.523C** and **5.523E**, is not subject to the provisions of No. **9.11A** and shall continue to be subject to Articles **9** (except No. **9.11A**) and **11** procedures, and to the provisions of No. **22.2**.

5.523E--No. **22.2** shall continue to apply in the bands 19.6-19.7 GHz and 29.4-29.5 GHz, between feeder links of non-geostationary mobile-satellite service networks and those fixed-satellite service networks for which complete Appendix **4** coordination information, or notification information, is considered as having been received by the Bureau by 21 November 1997.

5.524--*Additional allocation:* in Afghanistan, Algeria, Angola, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, China, the Congo, Costa Rica, Egypt, the United Arab Emirates, Gabon, Guatemala, Guinea, India, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Lebanon, Malaysia, Mali, Morocco, Mauritania, Nepal, Nigeria, Oman, Pakistan, the Philippines, Qatar, the Dem. Rep. of the Congo, Syria, the Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, Tanzania, Chad, Togo and Tunisia, the band 19.7-21.2 GHz is also allocated to the fixed and mobile services on a primary basis. This additional use shall not impose any limitation on the power flux-density of space stations in the fixed-satellite service in the band 19.7-21.2 GHz and of space stations in the mobile-satellite service in the band 19.7-20.2 GHz where the allocation to the mobile-satellite service is on a primary basis in the latter band.

5.525--In order to facilitate interregional coordination between networks in the mobile-satellite and fixed-satellite services, carriers in the mobile-satellite service that are most susceptible to interference shall, to the extent practicable, be located in the higher parts of the bands 19.7-20.2 GHz and 29.5-30 GHz.

5.526--In the bands 19.7-20.2 GHz and 29.5-30 GHz in Region 2, and in the bands 20.1-20.2 GHz and 29.9-30 GHz in Regions 1 and 3, networks which are both in the fixed-satellite service and in the mobile-satellite service may include links between earth stations at specified or unspecified points or while in motion, through one or more satellites for point-to-point and point-to-multipoint communications.

5.527--In the bands 19.7-20.2 GHz and 29.5-30 GHz, the provisions of No. **4.10** do not apply with respect to the mobile-satellite service.

5.528--The allocation to the mobile-satellite service is intended for use by networks which use narrow spot-beam antennas and other advanced technology at the space stations. Administrations operating systems in the mobile-satellite service in the band 19.7-20.1 GHz in Region 2 and in the band 20.1-20.2 GHz shall take all practicable steps to ensure the continued availability of these bands for administrations operating fixed and mobile systems in accordance with the provisions of No. **5.524**.

5.529--The use of the bands 19.7-20.1 GHz and 29.5-29.9 GHz by the mobile-satellite service in Region 2 is limited to satellite networks which are both in the fixed-satellite service and in the mobile-satellite service as described in No. **5.526**.

5.530--In Regions 1 and 3, the allocation to the broadcasting-satellite service in the band 21.4-22 GHz shall come into effect on 1 April 2007. The use of this band by the broadcasting-satellite service after that

date and on an interim basis prior to that date is subject to the provisions of Resolution **525 (WARC-92)**.
5.531--*Additional allocation:* in Japan, the band 21.4-22 GHz is also allocated to the broadcasting service on a primary basis.
5.532--The use of the band 22.21-22.5 GHz by the Earth exploration-satellite (passive) and space research (passive) services shall not impose constraints upon the fixed and mobile, except aeronautical mobile, services.
5.533--The inter-satellite service shall not claim protection from harmful interference from airport surface detection equipment stations of the radionavigation service.
5.534--(Suppressed by WRC-03)
5.535--In the band 24.75-25.25 GHz, feeder links to stations of the broadcasting-satellite service shall have priority over other uses in the fixed-satellite service (Earth-to-space). Such other uses shall protect and shall not claim protection from existing and future operating feeder-link networks to such broadcasting satellite stations.
5.535A--The use of the band 29.1-29.5 GHz (Earth-to-space) by the fixed-satellite service is limited to geostationary-satellite systems and feeder links to non-geostationary-satellite systems in the mobile-satellite service. Such use is subject to the application of the provisions of No. **9.11A**, but not subject to the provisions of No. **22.2**, except as indicated in Nos. **5.523C** and **5.523E** where such use is not subject to the provisions of No. **9.11A** and shall continue to be subject to Articles 9 (except No. **9.11A**) and **11** procedures, and to the provisions of No. **22.2**.
5.536--Use of the 25.25-27.5 GHz band by the inter-satellite service is limited to space research and Earth exploration-satellite applications, and also transmissions of data originating from industrial and medical activities in space.
5.536A--Administrations operating earth stations in the Earth exploration-satellite service or the space research service shall not claim protection from stations in the fixed and mobile services operated by other administrations. In addition, earth stations in the Earth exploration-satellite service or in the space research service should be operated taking into account Recommendations ITU-R SA.1278 and ITU-R SA.1625, respectively. (WRC-03)
5.536B--In Germany, Saudi Arabia, Austria, Belgium, Brazil, Bulgaria, China, Korea (Rep. of), Denmark, Egypt, United Arab Emirates, Spain, Estonia, Finland, France, Hungary, India, Iran (Islamic Republic of), Ireland, Israel, Italy, Jordan, Kenya, Kuwait, Lebanon, Libya, Liechtenstein, Lithuania, Moldova, Norway, Oman, Uganda, Pakistan, the Philippines, Poland, Portugal, Syria, Slovakia, the Czech Rep., Romania, the United Kingdom, Singapore, Sweden, Switzerland, Tanzania, Turkey, Viet Nam and Zimbabwe, earth stations operating in the Earth exploration-satellite service in the band 25.5-27 GHz shall not claim protection from, or constrain the use and deployment of, stations of the fixed and mobile services.
5.536C--In Algeria, Saudi Arabia, Bahrain, Botswana, Brazil, Cameroon, Comoros, Cuba, Djibouti, Egypt, United Arab Emirates, Estonia, Finland, Iran (Islamic Republic of), Israel, Jordan, Kenya, Kuwait, Lithuania, Malaysia, Morocco, Nigeria, Oman, Qatar, Syrian Arab Republic, Somalia, Sudan, Tanzania, Tunisia, Uruguay, Zambia and Zimbabwe, earth stations operating in the space research service in the band 25.5-27 GHz shall not claim protection from, or constrain the use and deployment of, stations of the fixed and mobile services. (WRC-03)
5.537--Space services using non-geostationary satellites operating in the inter-satellite service in the band 27-27.5 GHz are exempt from the provisions of No. **22.2**.
5.537A--In Bhutan, Korea (Rep. of), the Russian Federation, Indonesia, Iran (Islamic Republic of), Japan, Kazakhstan, Lesotho, Malaysia, Maldives, Mongolia, Myanmar, Uzbekistan, Pakistan, Philippines, Kyrgyzstan, the Dem. People's Rep. of Korea, Sri Lanka, Thailand and Viet Nam, the allocation to the fixed service in the band 27.5-28.35 GHz may also be used by high altitude platform stations (HAPS). The use of HAPS within the band 27.5-28.35 GHz is limited, within the territory of the countries listed above, to a single 300 MHz sub-band. Such use of 300 MHz of the fixed-service allocation by

HAPS in the above countries is further limited to operation in the HAPS-to-ground direction and shall not cause harmful interference to, nor claim protection from, other types of fixed-service systems or other co-primary services. Furthermore, the development of these other services shall not be constrained by HAPS. See Resolution **145 (WRC-03)**. (WRC-03)

5.538--*Additional allocation:* the bands 27.500-27.501 GHz and 29.999-30.000 GHz are also allocated to the fixed-satellite service (space-to-Earth) on a primary basis for the beacon transmissions intended for up-link power control. Such space-to-Earth transmissions shall not exceed an equivalent isotropically radiated power (e.i.r.p.) of +10 dBW in the direction of adjacent satellites on the geostationary-satellite orbit. In the band 27.500-27.501 GHz, such space-to-Earth transmissions shall not produce a power flux-density in excess of the values specified in Article **21**, Table 21-4 on the Earth's surface.

5.539--The band 27.5-30 GHz may be used by the fixed-satellite service (Earth-to-space) for the provision of feeder links for the broadcasting-satellite service.

5.540--*Additional allocation:* the band 27.501-29.999 GHz is also allocated to the fixed-satellite service (space-to-Earth) on a secondary basis for beacon transmissions intended for up-link power control.

5.541--In the band 28.5-30 GHz, the earth exploration-satellite service is limited to the transfer of data between stations and not to the primary collection of information by means of active or passive sensors.

5.541A--Feeder links of non-geostationary networks in the mobile-satellite service and geostationary networks in the fixed-satellite service operating in the band 29.1-29.5 GHz (Earth-to-space) shall employ uplink adaptive power control or other methods of fade compensation, such that the earth station transmissions shall be conducted at the power level required to meet the desired link performance while reducing the level of mutual interference between both networks. These methods shall apply to networks for which Appendix **4** coordination information is considered as having been received by the Bureau after 17 May 1996 and until they are changed by a future competent world radiocommunication conference. Administrations submitting Appendix **4** information for coordination before this date are encouraged to utilize these techniques to the extent practicable.

5.542--*Additional allocation:* in Algeria, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, China, Congo, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Guinea, India, Iran (Islamic Republic of), Iraq, Japan, Jordan, Kuwait, Lebanon, Malaysia, Mali, Morocco, Mauritania, Nepal, Pakistan, the Philippines, Qatar, Syria, the Dem. People's Rep. of Korea, Somalia, Sudan, Sri Lanka and Chad, the band 29.5-31 GHz is also allocated to the fixed and mobile services on a secondary basis. The power limits specified in Nos. **21.3** and **21.5** shall apply.

5.543--The band 29.95-30 GHz may be used for space-to-space links in the Earth exploration-satellite service for telemetry, tracking, and control purposes, on a secondary basis.

5.543A--In Bhutan, Korea (Rep. of), the Russian Federation, Indonesia, Iran (Islamic Republic of), Japan, Kazakhstan, Lesotho, Malaysia, Maldives, Mongolia, Myanmar, Uzbekistan, Pakistan, Philippines, Kyrgyzstan, the Dem. People's Rep. of Korea, Sri Lanka, Thailand and Viet Nam, the allocation to the fixed service in the band 31-31.3 GHz may also be used by systems using high altitude platform stations (HAPS) in the ground-to-HAPS direction. The use of the band 31-31.3 GHz by systems using HAPS is limited to the territory of the countries listed above and shall not cause harmful interference to, nor claim protection from, other types of fixed-service systems, systems in the mobile service and systems operated under No. **5.545**. Furthermore, the development of these services shall not be constrained by HAPS. Systems using HAPS in the band 31-31.3 GHz shall not cause harmful interference to the radio astronomy service having a primary allocation in the band 31.3-31.8 GHz, taking into account the protection criterion as given in Recommendation ITU-R RA.769. In order to ensure the protection of satellite passive services, the level of unwanted power density into a HAPS ground station antenna in the band 31.3-31.8 GHz shall be limited to -106 dB(W/MHz) under clear-sky conditions, and may be increased -100 dB(W/MHz) under rainy conditions to take account of rain attenuation, provided the effective impact on the passive satellite does not exceed the impact under clear-sky conditions as given above. See Resolution **145 (WRC-03)**.

5.544--In the band 31-31.3 GHz the power flux-density limits specified in Article **21**, Table 21-4 shall apply to the space research service.

5.545--*Different category of service:* in Armenia, Azerbaijan, Georgia, Mongolia, Kyrgyzstan, Tajikistan and Turkmenistan, the allocation of the band 31-31.3 GHz to the space research service is on a primary basis (see No. **5.33**). (WRC-03)

5.546--*Different category of service:* in Saudi Arabia, Armenia, Azerbaijan, Belarus, Egypt, the United Arab Emirates, Spain, Estonia, the Russian Federation, Finland, Georgia, Hungary, Iran (Islamic Republic of), Israel, Jordan, Latvia, Lebanon, Moldova, Mongolia, Uzbekistan, Poland, Syrian Arab Republic, Kyrgyzstan, Romania, the United Kingdom, South Africa, Tajikistan, Turkmenistan and Turkey, the allocation of the band 31.5-31.8 GHz to the fixed and mobile, except aeronautical mobile, services is on a primary basis (see No. **5.33**). (WRC-03)

5.547--The bands 31.8-33.4 GHz, 37-40 GHz, 40.5-43.5 GHz, 51.4-52.6 GHz, 55.78-59 GHz and 64-66 GHz are available for high-density applications in the fixed service (see Resolutions **75 (WRC-2000)** and **79 (WRC-2000)**). Administrations should take this into account when considering regulatory provisions in relation to these bands. Because of the potential deployment of high-density applications in the fixed-satellite service in the bands 39.5-40 GHz and 40.5-42 GHz (see No. **5.516B**), administrations should further take into account potential constraints to high-density applications in the fixed service, as appropriate. (WRC-03)

5.547A--Administrations should take practical measures to minimize the potential interference between stations in the fixed service and airborne stations in the radionavigation service in the 31.8-33.4 GHz band, taking into account the operational needs of the airborne radar systems.

5.547B--*Alternative allocation:* in the United States, the band 31.8-32 GHz is allocated to the radionavigation and space research (deep space) (space-to-Earth) services on a primary basis.

5.547C--*Alternative allocation*: in the United States, the band 32-32.3 GHz is allocated to the radionavigation and space research (deep space) (space-to-Earth) services on a primary basis. (WRC-03)

5.547D--*Alternative allocation:* in the United States, the band 32.3-33 GHz is allocated to the inter-satellite and radionavigation services on a primary basis.

5.547E--*Alternative allocation:* in the United States, the band 33-33.4 GHz is allocated to the radionavigation service on a primary basis.

5.548--In designing systems for the inter-satellite service in the band 32.3-33 GHz, for the radionavigation service in the band 32-33 GHz, and for the space research service (deep space) in the band 31.8-32.3 GHz, administrations shall take all necessary measures to prevent harmful interference between these services, bearing in mind the safety aspects of the radionavigation service (see Recommendation **707**). (WRC-03)

5.549--*Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Egypt, the United Arab Emirates, Gabon, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kuwait, Lebanon, Libyan Arab Jamahiriya, Malaysia, Mali, Malta, Morocco, Mauritania, Nepal, Nigeria, Oman, Pakistan, the Philippines, Qatar, Dem. Rep. of the Congo, Syrian Arab Republic, Singapore, Somalia, Sudan, Sri Lanka, Togo, Tunisia and Yemen, the band 33.4-36 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-03)

5.549A--In the band 35.5-36.0 GHz, the mean power flux-density at the Earth's surface, generated by any spaceborne sensor in the Earth exploration-satellite service (active) or space research service (active), for any angle greater than 0.8° from the beam centre shall not exceed -73.3 dB(W/m^2) in this band. (WRC-03)

5.550--*Different category of service:* in Armenia, Azerbaijan, Belarus, the Russian Federation, Georgia, Mongolia, Uzbekistan, Kyrgyzstan, Tajikistan and Turkmenistan, the allocation of the band 34.7-35.2 GHz to the space research service is on a primary basis (see No. **5.33**). (WRC-03)

5.551--(Suppressed by WRC-97)

5.551A--(Suppressed by WRC-03)

5.551AA--(Suppressed by WRC-03)
5.551B--(Suppressed by WRC-2000)
5.551C--(Suppressed by WRC-2000)
5.551D--(Suppressed by WRC-2000)
5.551E--(Suppressed by WRC-2000)
5.551F--*Different category of service:* in Japan, the allocation of the band 41.5-42.5 GHz to the mobile service is on a primary basis (see No. **5.33**).
5.551G--(Suppressed by WRC-03)
5.551H--The equivalent power flux-density (epfd) produced in the band 42.5-43.5 GHz by all space stations in any non-geostationary-satellite system in the fixed-satellite service (space-to-Earth), or in the broadcasting-satellite service (space-to-Earth) operating in the 42-42.5 GHz band, shall not exceed the following values at the site of any radio astronomy station for more than 2% of the time:

- 230 dB(W/m^2) in 1 GHz and –246 dB(W/m^2) in any 500 kHz of the 42.5-43.5 GHz band at the site of any radio astronomy station registered as a single-dish telescope; and
- 209 dB(W/m^2) in any 500 kHz of the 42.5-43.5 GHz band at the site of any radio astronomy station registered as a very long baseline interferometry station.

These epfd values shall be evaluated using the methodology given in Recommendation ITU-R S.1586 and the reference antenna pattern and the maximum gain of an antenna in the radio astronomy service given in Recommendation ITU-R RA.1631 and shall apply over the whole sky and for elevation angles higher than the minimum operating angle $_{min}$ of the radiotelescope (for which a default value of 5° should be adopted in the absence of notified information).

These values shall apply at any radio astronomy station that either:

- was in operation prior to 5 July 2003 and has been notified to the Radiocommunication Bureau before 4 January 2004; or
- was notified before the date of receipt of the complete Appendix **4** information for coordination or notification, as appropriate, for the space station to which the limits apply.

Other radio astronomy stations notified after these dates may seek an agreement with administrations that have authorized the space stations. In Region 2, Resolution **743 (WRC-03)** shall apply. The limits in this footnote may be exceeded at the site of a radio astronomy station of any country whose administration so agreed. (WRC-03)
5.551I--The power flux-density in the band 42.5-43.5 GHz produced by any geostationary space station in the fixed-satellite service (space-to-Earth), or the broadcasting-satellite service (space-to-Earth) operating in the 42-42.5 GHz band, shall not exceed the following values at the site of any radio astronomy station:

- 137 dB(W/m^2) in 1 GHz and –153 dB(W/m^2) in any 500 kHz of the 42.5-43.5 GHz band at the site of any radio astronomy station registered as a single-dish telescope; and
- 116 dB(W/m^2) in any 500 kHz of the 42.5-43.5 GHz band at the site of any radio astronomy station registered as a very long baseline interferometry station.

These values shall apply at the site of any radio astronomy station that either:

- was in operation prior to 5 July 2003 and has been notified to the Radiocommunication Bureau before 4 January 2004; or
- was notified before the date of receipt of the complete Appendix **4** information for coordination or notification, as appropriate, for the space station to which the limits apply.

Other radio astronomy stations notified after these dates may seek an agreement with administrations that have authorized the space stations. In Region 2, Resolution **743 (WRC-03)** shall apply. The limits in this footnote may be exceeded at the site of a radio astronomy station of any country whose administration so agreed. (WRC-03)
5.552--The allocation of the spectrum for the fixed-satellite service in the bands 42.5-43.5 GHz and 47.2-50.2 GHz for Earth-to-space transmission is greater than that in the band 37.5-39.5 GHz for space-to-

Earth transmission in order to accommodate feeder links to broadcasting satellites. Administrations are urged to take all practicable steps to reserve the band 47.2-49.2 GHz for feeder links for the broadcasting-satellite service operating in the band 40.5-42.5 GHz.

5.552A--The allocation to the fixed service in the bands 47.2-47.5 GHz and 47.9-48.2 GHz is designated for use by high altitude platform stations. The use of the bands 47.2-47.5 GHz and 47.9-48.2 GHz is subject to the provisions of Resolution **122 (WRC-97)**.[6]

5.553--In the bands 43.5-47 GHz and 66-71 GHz, stations in the land mobile service may be operated subject to not causing harmful interference to the space radiocommunication services to which these bands are allocated (see No. **5.43**).

5.554--In the bands 43.5-47 GHz, 66-71 GHz, 95-100 GHz, 123-130 GHz, 191.8-200 GHz and 252-265 GHz, satellite links connecting land stations at specified fixed points are also authorized when used in conjunction with the mobile-satellite service or the radionavigation-satellite service.

5.554A--The use of the bands 47.5-47.9 GHz, 48.2-48.54 GHz and 49.44-50.2 GHz by the fixed-satellite service (space-to-Earth) is limited to geostationary satellites. (WRC-03)

5.555--*Additional allocation:* the band 48.94-49.04 GHz is also allocated to the radio astronomy service on a primary basis.

5.555A--(Suppressed by WRC-03)

5.555B--The power flux-density in the band 48.94-49.04GHz produced by any geostationary space station in the fixed-satellite service (space-to-Earth) operating in the bands 48.2-48.54GHz and 49.44-50.2GHz shall not exceed –151.8dB(W/m^2) in any 500 kHz band at the site of any radio astronomy station. (WRC-03)

5.556--In the bands 51.4-54.25 GHz, 58.2-59 GHz and 64-65 GHz, radio astronomy observations may be carried out under national arrangements.

5.556A--Use of the bands 54.25-56.9 GHz, 57-58.2 GHz and 59-59.3 GHz by the inter-satellite service is limited to satellites in the geostationary-satellite orbit. The single-entry power flux-density at all altitudes from 0 km to 1000 km above the Earth's surface produced by a station in the inter-satellite service, for all conditions and for all methods of modulation, shall not exceed -147 dB(W/(m^2 · 100 MHz)) for all angles of arrival.

5.556B--*Additional allocation:* in Japan, the band 54.25-55.78 GHz is also allocated to the mobile service on a primary basis for low-density use.

5.557--*Additional allocation:* in Japan, the band 55.78-58.2 GHz is also allocated to the radiolocation service on a primary basis.

5.557A--In the band 55.78-56.26 GHz, in order to protect stations in the Earth exploration-satellite service (passive), the maximum power density delivered by a transmitter to the antenna of a fixed service station is limited to –26 dB(W/MHz).

5.558--In the bands 55.78-58.2 GHz, 59-64 GHz, 66-71 GHz, 122.25-123 GHz, 130-134 GHz, 167-174.8 GHz and 191.8-200 GHz, stations in the aeronautical mobile service may be operated subject to not causing harmful interference to the inter-satellite service (see No. **5.43**).

5.558A--Use of the band 56.9-57 GHz by inter-satellite systems is limited to links between satellites in geostationary-satellite orbit and to transmissions from non-geostationary satellites in high-Earth orbit to those in low-Earth orbit. For links between satellites in the geostationary-satellite orbit, the single entry power flux-density at all altitudes from 0 km to 1000 km above the Earth's surface, for all conditions and for all methods of modulation, shall not exceed –147 dB(W/(m^2 · 100 MHz)) for all angles of arrival.

5.559--In the band 59-64 GHz, airborne radars in the radiolocation service may be operated subject to not causing harmful interference to the inter-satellite service (see No. **5.43**).

5.559A--The band 75.5-76 GHz is also allocated to the amateur and amateur-satellite services on a primary basis until the year 2006.

5.560--In the band 78-79 GHz radars located on space stations may be operated on a primary basis in the

6. Note by the Secretariat: This Resolution was revised by WRC-2000.

Earth exploration-satellite service and in the space research service.

5.561--In the band 74-76 GHz, stations in the fixed, mobile and broadcasting services shall not cause harmful interference to stations of the fixed-satellite service or stations of the broadcasting-satellite service operating in accordance with the decisions of the appropriate frequency assignment planning conference for the broadcasting-satellite service.

5.561A--The 81-81.5 GHz band is also allocated to the amateur and amateur-satellite services on a secondary basis.

5.561B--In Japan, use of the band 84-86 GHz, by the fixed-satellite service (Earth-to-space) is limited to feeder links in the broadcasting-satellite service using the geostationary-satellite orbit.

5.562--The use of the band 94-94.1 GHz by the Earth exploration-satellite (active) and space research (active) services is limited to spaceborne cloud radars.

5.562A--In the bands 94-94.1 GHz and 130-134 GHz, transmissions from space stations of the Earth exploration-satellite service (active) that are directed into the main beam of a radio astronomy antenna have the potential to damage some radio astronomy receivers. Space agencies operating the transmitters and the radio astronomy stations concerned should mutually plan their operations so as to avoid such occurrences to the maximum extent possible.

5.562B--In the bands 105-109.5 GHz, 111.8-114.25 GHz, 155.5-158.5 GHz and 217-226 GHz, the use of this allocation is limited to space-based radio astronomy only.

5.562C--Use of the band 116-122.25 GHz by the inter-satellite service is limited to satellites in the geostationary-satellite orbit. The single-entry power flux-density produced by a station in the inter-satellite service, for all conditions and for all methods of modulation, at all altitudes from 0 km to 1000 km above the Earth's surface and in the vicinity of all geostationary orbital positions occupied by passive sensors, shall not exceed -148 dB (W/(m² · MHz)) for all angles of arrival.

5.562D--*Additional allocation:* In Korea (Rep. of), the bands 128-130 GHz, 171-171.6 GHz, 172.2-172.8 GHz and 173.3-174 GHz are also allocated to the radio astronomy service on a primary basis until 2015.

5.562E--The allocation to the Earth exploration-satellite service (active) is limited to the band 133.5-134 GHz.

5.562F--In the band 155.5-158.5 GHz, the allocation to the Earth exploration-satellite (passive) and space research (passive) services shall terminate on 1 January 2018.

5.562G--The date of entry into force of the allocation to the fixed and mobile services in the band 155.5-158.5 GHz shall be 1 January 2018.

5.562H--Use of the bands 174.8-182 GHz and 185-190 GHz by the inter-satellite service is limited to satellites in the geostationary-satellite orbit. The single-entry power flux-density produced by a station in the inter-satellite service, for all conditions and for all methods of modulation, at all altitudes from 0 to 1000 km above the Earth's surface and in the vicinity of all geostationary orbital positions occupied by passive sensors, shall not exceed -144 dB(W/(m² · MHz)) for all angles of arrival.

5.563--(Suppressed by WRC-03)

5.563A--In the bands 200-209 GHz, 235-238 GHz, 250-252 GHz and 265-275 GHz, ground-based passive atmospheric sensing is carried out to monitor atmospheric constituents.

5.563B--The band 237.9-238 GHz is also allocated to the Earth exploration-satellite service (active) and the space research service (active) for spaceborne cloud radars only.

5.565--The frequency band 275-1000 GHz may be used by administrations for experimentation with, and development of, various active and passive services. In this band a need has been identified for the following spectral line measurements for passive services:

– radio astronomy service: 275-323 GHz, 327-371 GHz, 388-424 GHz, 426-442 GHz, 453-510 GHz, 623-711 GHz, 795-909 GHz and 926-945 GHz;

– Earth exploration-satellite service (passive) and space research service (passive): 275-277 GHz, 294-306 GHz, 316-334 GHz, 342-349 GHz, 363-365 GHz, 371-389 GHz, 416-434 GHz, 442-444 GHz,

496-506 GHz, 546-568 GHz, 624-629 GHz, 634-654 GHz, 659-661 GHz, 684-692 GHz, 730-732 GHz, 851-853 GHz and 951-956 GHz.

– Future research in this largely unexplored spectral region may yield additional spectral lines and continuum bands of interest to the passive services. Administrations are urged to take all practicable steps to protect these passive services from harmful interference until the date when the allocation Table is established in the above-mentioned frequency band.

UNITED STATES (US) FOOTNOTES

(These footnotes, each consisting of the letters US followed by one or more digits, denote stipulations applicable to both Federal Government and non-Federal Government stations.)

US7--In the band 420-450 MHz and within the following areas, the peak envelope power output of a transmitter employed in the amateur service shall not exceed 50 watts, unless expressly authorized by the Commission after mutual agreement, on a case-by-case basis, between the Federal Communications Commission Engineer in Charge at the applicable district office and the military area frequency coordinator at the applicable military base. For areas (e) through (j), the appropriate military coordinator is located at Peterson AFB, CO.

(a) The entire State of New Mexico and Texas west of longitude 104°00' West;

(b) The entire State of Florida including the Key West area and the areas enclosed within a 322-kilometer (200-mile) radius of Patrick Air Force Base, Florida (latitude 28°21'North, longitude 80°43' West), and within a 322-kilometer (200-mile) radius of Eglin Air Force Base, Florida (latitude 30°30'North, longitude 86°30'West);

(c) The entire State of Arizona;

(d) Those portions of California and Nevada south of latitude 37°10'North, and the areas enclosed within a 322-kilometer (200-mile) radius of the Pacific Missile Test Center, Point Mugu, California (latitude 34°09'North, longitude 119°11'West).

(e) In the State of Massachusetts within a 160-kilometer (100-mile) radius around locations at Otis Air Force Base, Massachusetts (latitude 41°45'North, longitude 70°32'West).

(f) In the State of California within a 240-kilometer (150-mile) radius around locations at Beale Air Force Base, California (latitude 39°08'North, longitude 121°26'West).

(g) In the State of Alaska within a 160-kilometer (100-mile) radius of Clear, Alaska (latitude 64°17'North, longitude 149°10'West).

(h) In the State of North Dakota within a 160-kilometer (100-mile) radius of Concrete, North Dakota (latitude 48°43'North, longitude 97°54'West).

(i) In the States of Alabama, Georgia and South Carolina within a 200-kilometer (124-mile) radius of Warner Robins Air Force Base, Georgia (latitude 32°38'North, longitude 83°35' West).

(j) In the State of Texas within a 200-kilometer (124-mile) radius of Goodfellow Air Force Base, Texas (latitude 31°25' North, longitude 100°24'West).

US8--The use of the frequencies 170.475, 171.425, 171.575, and 172.275 MHz east of the Mississippi River, and 170.425, 170.575, 171.475, 172.225 and 172.375 MHz west of the Mississippi River may be authorized to fixed, land and mobile stations operated by non-Federal forest firefighting agencies. In addition, land stations and mobile stations operated by non-Federal conservation agencies, for mobile relay operation only, may be authorized to use the frequency 172.275 MHz east of the Mississippi River and the frequency 171.475 MHz west of the Mississippi River. The use of any of the foregoing nine frequencies shall be on the condition that no harmful interference will be caused to Government stations.

US11--The use of the frequencies 166.25 and 170.15MHz may be authorized to non-Federal Government remote pickup broadcast base and land mobile stations and to non-Federal Government base, fixed and land mobile stations in the public safety radio services on the condition that harmful interference shall not be caused to present or future Federal Government stations in the band 162-174 MHz. Authorization on

these frequencies shall be in the lower 48 contiguous States only, except within the area bounded on the west by the Mississippi River, on the north by the parallel of latitude 37× 30' N., and on the east and south by that arc of the circle with center at Springfield, Illinois, and radius equal to the airline distance between Springfield, Illinois, and Montgomery, Alabama, subtended between the foregoing west and north boundaries. The use of these frequencies by remote pickup broadcast stations shall not be authorized for locations within 150 miles (241.4 km) of New York City; and use of these frequencies by the public safety radio services shall not be authorized except for locations within 150 miles of New York City.

US13[7]**--**For the specific purposes of transmitting hydrological and meteorological data in cooperation with agencies of the Federal Government the following frequencies may be authorized to non-Government fixed stations on the condition that harmful interference will not be caused to Government stations:

MHz	MHz	MHz	MHz	MHz	MHz
169.4250	170.2250	171.0250	171.8250	406.1250	406.1250
169.4375	170.2375	171.0375	171.8375	406.1750	406.1750
169.4500	170.2500	171.0500	171.8500	412.6625	412.6625
169.4625	170.2625	171.0625	171.8625	412.6750	412.6750
169.4750	170.2750	171.0750	171.8750	412.6875	412.6875
169.4875	170.2875	171.0875	171.8875	412.7125	412.7125
169.5000	170.3000	171.1000	171.9000		
169.5125	170.3125	171.1125	171.9125		
169.5250	170.3250	171.1250	171.9250		

All new hydrologic systems are required to operate with a necessary bandwidth less than 12.5 kHz and may use all frequencies shown above. Existing systems operating in the 162-174 MHz band may continue using equipment operating with necessary bandwidths of 12.5 kHz or greater using the center frequencies listed above that are spaced 25 kHz apart beginning with 169.425, 170.225, 171.025 and 171.825 MHz until December 31, 2004, after which date they must have been converted to narrow band equipment operating with a necessary bandwidth less than 12.5 kHz. In addition, existing systems operating in the 406.1-420 MHz band may, until December 31, 2007, continue using equipment with necessary bandwidths of 12.5 kHz or greater on the following center frequencies: 406.125, 406.175, 409.675, 409.725, 412.625, 412.675, 412.725, and 412.775 MHz. After December 31, 2007, all hydrologic systems in the 406.1-420 MHz band must have transitioned to the center frequencies listed above and to equipment operating with necessary bandwidths less than 12.5 kHz. New assignments on frequencies 406.1250 and 406.1750 MHz are to be primarily for paired operations with frequencies 415.1250 and 415.1750 MHz, respectively.

US14--When 500 kHz is being used for distress purposes, ship and coast stations using morse telegraph may use 512 kHz for calling.

US18--Navigation aids in the U.S. and its insular areas in the bands 9-14 kHz, 90-110 kHz, 190-415 kHz, 510-535 kHz, and 2700-2900 MHz are normally operated by the Federal Government. However, authorizations may be made by the FCC for non-Federal Government operations in these bands subject to the conclusion of appropriate arrangements between the FCC and the Federal agencies concerned and upon special showing of need for service which the Federal Government is not yet prepared to render.

US25--The use of frequencies 26110 kHz, 26130 kHz, 26151 kHz, and 26172 kHz may be authorized to non-Federal Government remote pickup broadcast base and mobile stations on the condition that harmful interference is not caused to the reception of either international broadcast stations transmitting in the band 25850-26100 kHz or to coast stations transmitting in the band 26100-26175 kHz.

US26--The bands 117.975-121.4125 MHz, 123.5875-128.8125 MHz and 132.0125-136.0 MHz are for air traffic control communications.

US28--The band 121.5875-121.9375 MHz is for use by aeronautical utility land and mobile stations, and

7. FCC action is pending concerning this footnote.

for air traffic control communications.

US30--The band 121.9375-123.0875 MHz is available to FAA aircraft for communications pursuant to flight inspection functions in accordance with the Federal Aviation Act of 1958.

US31--The frequencies 122.700, 122.725, 122.750, 122.800, 122.950, 122.975, 123.000, 123.050 and 123.075 MHz may be assigned to aeronautical advisory stations. In addition, at landing areas having a part-time or no airdrome control tower or FAA flight service station, these frequencies may be assigned on a secondary non-interference basis to aeronautical utility mobile stations, and may be used by FAA ground vehicles for safety related communications during inspections conducted at such landing areas.

The frequencies 122.850, 122.900 and 122.925 MHz may be assigned to aeronautical multicom stations. In addition, 122.850 MHz may be assigned on a secondary noninterference basis to aeronautical utility mobile stations. In case of 122.925 MHz, US213 applies.

Air carrier aircraft stations may use 122.000 and 122.050 MHz for communication with aeronautical stations of the Federal Aviation Administration and 122.700, 122.800, 122.900 and 123.000 MHz for communications with aeronautical stations pertaining to safety of flight with and in the vicinity of landing areas not served by a control tower.

Frequencies in the band 121.9375-122.6875 MHz may be used by aeronautical stations of the Federal Aviation Administration for communication with aircraft stations.

US32--Except for the frequencies 123.3 and 123.5 MHz, which are not authorized for Government use, the band 123.1125-123.5875 MHz is available for FAA communications incident to flight test and inspection activities pertinent to aircraft and facility certification on a secondary noninterference basis.

US33--The band 123.1125-123.5875 MHz is for use by flight test and aviation instructional stations. The frequency 121.950 MHz is available for aviation instructional stations.

US41--The Government radiolocation service is permitted in the band 2450-2500 MHz on condition that harmful interference is not caused to non-Government services.

US44--The non-Government radiolocation service may be authorized in the band 2900-3100 MHz on the condition that no harmful interference is caused to Government services.

US48--In the band 9000-9200 MHz, the use of the radiolocation service by non-Federal Government licensees may be authorized on the condition that harmful interference is not caused to the aeronautical radionavigation service or to the Federal Government radiolocation service.

US49--The non-Government radiolocation service may be authorized in the band 5460-5470 MHz on the condition that it does not cause harmful interference to the aeronautical or maritime radionavigation services or to the Government radiolocation service.

US50--In the band 5470-5650 MHz, the radiolocation service may be authorized for non-Federal Government use on the condition that harmful interference is not caused to the maritime radionavigation service or to the Federal Government radiolocation service.

US51--In the band 9300-9500 MHz, the radiolocation service may be authorized for non-Federal Government use on the condition that harmful interference is not caused to the Federal Government radiolocation service.

US53--In view of the fact that the band 13.25-13.4 GHz is allocated to doppler navigation aids, Government, and non-Government airborne doppler radars in the aeronautical radionavigation service are permitted in the band 8750-8850 MHz only on the condition that they must accept any interference that may be experienced from stations in the radiolocation service in the band 8500-10000 MHz.

US58--In the band 10000-10500 MHz, pulsed emissions are prohibited, except for weather radars on board meteorological satellites in the band 10000-10025 MHz. The amateur service and the non-Government radiolocation service, which shall not cause harmful interference to the Government radiolocation service, are the only non-Government services permitted in this band. The non-Government radiolocation service is limited to survey operations as specified in footnote US108.

US59--The band 10.5-10.55 GHz is restricted to systems using type NON (AO) emission with a power not to exceed 40 watts into the antenna.

US65--The use of the band 5460-5650 MHz by the maritime radionavigation service is limited to ship-

borne radars.

US66--The use of the band 9300–9500 MHz by the aeronautical radionavigation service is limited to airborne radars and associated airborne beacons. In addition, ground-based radar beacons in the aeronautical radionavigation service are permitted in the band 9300-9320 MHz on the condition that harmful interference is not caused to the maritime radionavigation service.

US67--The use of the band 9300-9500 MHz by the meteorological aids service is limited to ground-based radars. Radiolocation installations will be coordinated with the meteorological aids service and, insofar as practicable, will be adjusted to meet the requirements of the meteorological aids service.

US69--In the band 31.8-33.4 GHz, ground-based radionavigation aids are not permitted except where they operate in cooperation with airborne or shipborne radionavigation devices.

US70--The meteorological aids service allocation in the band 400.15-406.0 MHz does not preclude the operation therein of associated ground transmitters.

US71--In the band 9300-9320 MHz, low-powered maritime radionavigation stations shall be protected from harmful interference caused by the operation of land-based equipment.

US74--In the bands 25.55-25.67, 73.0-74.6, 406.1-410.0, 608-614, 1400-1427, 1660.5-1670.0, 26902700, and 4990-5000 MHz, and in the bands 10.68-10.7, 15.35-15.4, 23.6-24.0, 31.3-31.5, 86-92, 100-102, 109.5-111.8, 114.25-116, 148.5-151.5, 164-167, 200-209, and 250-252 GHz, the radio astronomy service shall be protected from extraband radiation only to the extent that such radiation exceeds the level which would be present if the offending station were operating in compliance with the technical standards or criteria applicable to the service in which it operates. Radio astronomy observations in these bands are performed at the locations listed in US311.

US77--Government stations may also be authorized: (a) Port operations use on a simplex basis by coast and ship stations of the frequencies 156.6 and 156.7 MHz; (b) Duplex port operations use of the frequency 157.0 MHz for ship stations and 161.6 MHz for coast stations; (c) Inter-ship use of 156.3 MHz on a simplex basis; and (d) Vessel traffic services under the control of the U.S. Coast Guard on a simplex basis by coast and ship stations on the frequencies 156.25, 156.55, 156.6 and 156.7 MHz. (e) Navigational bridge-to-bridge and navigational communications on a simplex basis by coast and ship stations on the frequencies 156.375 and 156.65 MHz.

US78--In the mobile service, the frequencies between 1435 and 1525 MHz will be assigned for aeronautical telemetry and associated telecommand operations for flight testing of manned or unmanned aircraft and missiles, or their major components. Permissible usage includes telemetry associated with launching and reentry into the Earth's atmosphere as well as any incidental orbiting prior to reentry of manned objects undergoing flight tests. The following frequencies are shared with flight telemetry mobile stations: 1444.5, 1453.5, 1501.5, 1515.5, and 1524.5 MHz.

US80--Government stations may use the frequency 122.9 MHz subject to the following conditions: (a) All operations by Government stations shall be restricted to the purpose for which the frequency is authorized to non-Government stations, and shall be in accordance with the appropriate provisions of the Commission's Rules and Regulations, Part 87, Aviation Services; (b) Use of the frequency is required for coordination of activities with Commission licensees operating on this frequency; and (c) Government stations will not be authorized for operation at fixed locations.

US81--The band 38.0-38.25 MHz is used by both Government and non-Government radio astronomy observatories. No new fixed or mobile assignments are to be made and Government stations in the band 38.0-38.25 MHz will be moved to other bands on a case-by-case basis, as required, to protect radio astronomy observations from harmful interference. As an exception, however, low powered military transportable and mobile stations used for tactical and training purposes will continue to use the band. To the extent practicable, the latter operations will be adjusted to relieve such interference as may be caused to radio astronomy observations. In the event of harmful interference from such local operations, radio astronomy observatories may contact local military commands directly, with a view to effecting relief. A list of military commands, areas of coordination, and points of contact for purposes of relieving interfer-

ence may be obtained upon request from the Office of the Chief Engineer, Federal Communications Commission, Washington, D.C. 20554.

US82--The assignable frequencies in the bands 4146-4152 kHz, 6224-6233 kHz, 8294-8300 kHz, 12353-12368 kHz, 16528-16549 kHz, 18825-18846 kHz, 22159-22180 kHz, and 25100-25121 kHz may be authorized on a shared non-priority basis to Federal and non-Federal Government ship and coast stations (SSB telephony, with peak envelope power not to exceed 1 kW).

US87--The frequency 450 MHz, with maximum emission bandwidth of 500 kHz, may be used by Government and non-Government stations for space telecommand at specific locations, subject to such conditions as may be applied on a case-by-case basis.

US90--In the band 2025-2110 MHz, the power flux-density at the Earth's surface produced by emissions from a space station in the space operation, Earth exploration-satellite, or space research services that is transmitting in the space-to-space direction, for all conditions and all methods of modulation, shall not exceed the following values in any 4 kHz sub-band:

a. -154 dBW/m^2 for angles of arrival above the horizontal plane (δ) of $0°$ to $5°$,

b. $-154 + 0.5(\delta - 5)$ dBW/m^2 for δ of $5°$ to $25°$, and

c. -144 dBW/m^2 for δ of $25°$ to $90°$.

US93--In the conterminous United States, the frequency 108.0 MHz may be authorized for use by VOR test facilities, the operation of which is not essential for the safety of life or property, subject to the condition that no interference is caused to the reception of FM broadcasting stations operating in the band 88-108 MHz. In the event that such interference does occur, the licensee or other agency authorized to operate the facility shall discontinue operation on 108 MHz and shall not resume operation until the interference has been eliminated or the complaint otherwise satisfied. VOR test facilities operating on 108 MHz will not be protected against interference caused by FM broadcasting stations operating in the band 88-108 MHz not shall the authorization of a VOR test facility on 108 MHz preclude the Commission from authorizing additional FM broadcasting stations.

US99--In the band 1668.4-1670.0 MHz, the meteorological aids service (radiosonde) will avoid operations to the maximum extent practicable. Whenever it is necessary to operate radiosondes in the band 1668.4-1670 MHz within the United States, notification of the operations shall be sent as far in advance as possible to the Electromagnetic Management Unit, National Science Foundation, Washington, D.C. 20550.

US102--In Alaska only, the frequency 122.1 MHz may also be used for air carrier air traffic control purposes at locations where other frequencies are not available to air carrier aircraft stations for air traffic control.

US104--The LORAN Radionavigation System has priority in the band 90-110 kHz in the United States and its insular areas. Radiolocation land stations making use of LORAN type equipment may be authorized to both Federal and non-Federal Government licensees on a secondary basis for offshore radiolocation activities only at specific locations and subject to such technical and operational conditions (e.g., power, emission, pulse rate and phase code, hours of operation), including on-the-air testing, as may be required on a case-by-case basis to ensure protection of the LORAN radionavigation system from harmful interference and to ensure mutual compatibility among radiolocation operators. Such authorizations to stations in the radiolocation service are further subject to showing of need for service which is not currently provided and which the Federal Government is not yet prepared to render by way of the radionavigation service.

US106--The frequency 156.75 MHz is available for assignment to non-Government and Government stations for environmental communications in accordance with an agreed plan.

US107--The frequency 156.8 MHz is the national distress, safety and calling frequency for the maritime mobile VHF radiotelephone service for use by Government and non-Government ship and coast stations. Guard bands of 156.7625-156.7875 and 156.8125-156.8375 MHz are maintained.

US108--Within the bands 3300-3500 MHz and 10000-10500 MHz, survey operations, using transmitters with a peak power not to exceed five watts into the antenna, may be authorized for Government and non-Government use on a secondary basis to other Government radiolocation operations.

US110-- In the band 9200-9300 MHz, the use of the radiolocation service by non-Federal Government licensees may be authorized on the condition that harmful interference is not caused to the maritime radionavigation service or to the Federal Government radiolocation service.

US112--The frequency 123.1 MHz is for search and rescue communications. This frequency may be assigned for air traffic control communications at special aeronautical events on the condition that no harmful interference is caused to search and rescue communications during any period of search and rescue operations in the locale involved.

US116--In the bands 890-902 MHz and 935-941 MHz, no new assignments are to be made to Government radio stations after July 10, 1970 except on case-by-case basis, to experimental stations and to additional stations of existing networks in Alaska. Government assignments existing prior to July 10, 1970 to stations in Alaska may be continued. All other existing Government assignments shall be on a secondary basis to stations in the non-Government land mobile service and shall be subject to adjustment or removal from the bands 890-902 MHz, 928-932 MHz and 935-941 MHz at the request of the FCC.

US117--In the band 406.1-410 MHz, all new authorizations will be limited to a maximum 7 watts per kHz of necessary bandwidth; existing authorizations as of November 30, 1970 exceeding this power are permitted to continue in use. New authorizations in this band stations, other than mobile stations, within the following areas are subject to prior coordination by the applicant through the Electromagnetic Spectrum Management Unit, National Science Foundation, Washington, D.C. 20550, (202-357-9696):

Arecibo Observatory: Rectangle between latitudes 17°30'N. and 19°00'N. and between longitudes 65° 10' W. and 68°00'W.

Owens Valley Radio Observatory: Two contiguous rectangles, one between latitudes 36°N. and 37°N. and longitudes 117°40' W. and 118°30' W. and the second between latitudes 37°N. and 38°N. and longitudes 118°W. and 118°50' W.

Sagamore Hill Radio Observatory: Rectangle between latitudes 42° 10'N. and 43° 00'N. and longitudes 70° 31'W. and 71° 31'W.

Table Mountain Solar Observatory (NOAA), Boulder, Colorado (407–409 MHz only): Rectangle between latitudes 39° 30'N. and 40° 30'N. and longitudes 104° 30'W. and 106° 00'W. or the Continental Divide whichever is farther east.

The non-Government use of this band is limited to the radio astronomy service and as provided by footnote US13.

US201--In the band 460-470 MHz, space stations in the Earth exploration-satellite service may be authorized for space-to-Earth transmissions on a secondary basis with respect to the fixed and mobile services. When operating in the meteorological-satellite service, such stations shall be protected from harmful interference from other applications of the Earth exploration-satellite service. The power flux produced at the Earth's surface by any space station in this band shall not exceed -152 dBW/m^2/4 kHz.

US203--Radio astronomy observations of the formaldehyde line frequencies 4825-4835 MHz and 14.470–14.500 GHz may be made at certain radio astronomy observatories as indicated below:

Bands to be observed		Observatory
4 GHz	14 GHz	
X		National Astronomy and Ionosphere Center, Arecibo, Puerto Rico.
X	X	National Radio Astronomy Observatory, Green Bank, W. Va.
X	X	National Radio Astronomy Observatory, Socorro, New Mexico.
X	X	Hat Creek Observatory (U of Calif.), Hat Creek, Cal.
X	X	Haystack Radio Observatory (MIT-Lincoln Lab), Tyngsboro, Mass.
X	X	Owens Valley Radio Observatory (Cal. Tech.), Big Pine, Cal.

	X	Five College Radio Astronomy Observatory, Quabbin Reservoir (near Amherst), Massachusetts

Every practicable effort will be made to avoid the assignment of frequencies to stations in the fixed or mobile services in these bands. Should such assignments result in harmful interference to these observations, the situation will be remedied to the extent practicable.

US205--Tropospheric scatter systems are prohibited in the band 2500-2690 MHz.

US208--Planning and use of the band 1559-1626.5 MHz necessitate the development of technical and/or operational sharing criteria to ensure the maximum degree of electromagnetic compatibility with existing and planned systems within the band.

US209--The use of frequencies 460.6625, 460.6875, 460.7125, 460.7375, 460.7625, 460.7875, 460.8125, 460.8375, 460.8625, 465.6625, 465.6875, 465.7125, 465.7375, 465.7625, 465.7875, 465.8125, 465.8375, and 465.8625 MHz may be authorized, with 100 mW or less output power, to Government and non-Government radio stations for one-way, non-voice bio-medical telemetry operations in hospitals, or medical or convalescent centers.

US210--In the bands 40.66-40.7 MHz and 216-220 MHz, frequencies may be authorized to Government and non-Government stations on a secondary basis for the tracking of, and telemetering of scientific data from, ocean buoys and wildlife. Operation in these bands is subject to the technical standards specified in: (a) Section 8.2.42 of the NTIA Manual for Government use, or (b) 47 CFR § 90.248 for non-Government use. After January 1, 2002, no new assignments shall be authorized in the band 216-217 MHz.

US211--In the bands 1670-1690, 5000-5250 MHz and 10.7-11.7, 15.1365-15.35, 15.4-15.7, 22.5-22.55, 24-24.05, 31.0-31.3, 31.8-32.0, 40.5-42.5, 116-122.25, 123-130, 158.5-164, 167-168, 191.8-200, and 252-265 GHz, applicants for airborne or space station assignments are urged to take all practicable steps to protect radio astronomy observations in the adjacent bands from harmful interference; however, US74 applies.

US212--In the State of Alaska, the carrier frequency 5167.5 kHz (assigned frequency 5168.9 kHz) is designated for emergency communications. This frequency may also be used in the Alaska-Private Fixed Service for calling and listening, but only for establishing communications before switching to another frequency. The maximum power is limited to 150 watts peak envelope power (PEP).

US213--The frequency 122.925 MHz is for use only for communications with or between aircraft when coordinating natural resources programs of Federal or State natural resources, agencies, including forestry management and fire suppression, fish and game management and protection and environmental monitoring and protection.

US214--The frequency 157.1 MHz is the primary frequency for liaison communications between ship stations and stations of the United States Coast Guard.

US215--Emissions from microwave ovens manufactured on and after January 1, 1980, for operation on the frequency 915 MHz must be confined within the band 902-928 MHz. Emissions from microwave ovens manufactured prior to January 1, 1980, for operation on the frequency 915 MHz must be confined within the band 902-940 MHz. Radiocommunications services operating in the band 928-940 MHz must accept any harmful interference from the operation of microwave ovens manufactured before January 1, 1980.

US216--The frequencies 150.775 and 150.790, and the bands 152-152.0150, 163.2375-163.2625, 462.9375-463.1875 and 467.9375-468.1875 MHz are authorized for Government/non-Government operations in medical radio communications systems.

US217--In the band 420-450 MHz, pulse-ranging radiolocation systems may be authorized for Federal and non-Federal Government use along the shorelines of the contiguous 48 States and Alaska. In the sub-band 420-435 MHz, spread spectrum radiolocation systems may be authorized for Federal and non-Federal Government use within the contiguous 48 States and Alaska. All stations operating in accordance with this provision shall be secondary to stations operating in accordance with the Table of Frequency Allocations. Authorizations shall be granted on a case-by-case basis; however, operations proposed to be located within the following geographic areas should not expect to be accommodated:

(a) The entire State of New Mexico and Texas west of longitude 104° 00' West;

(b) The entire State of Florida including the Key West area and the areas enclosed within a 322-kilometer (200-mile) radius of Patrick Air Force Base, Florida (latitude 28° 21' North, longitude 80° 43' West), and within a 322-kilometer (200-mile) radius of Eglin Air Force Base, Florida (latitude 30° 30' North, longitude 86° 30' West);

(c) The entire State of Arizona;

(d) Those portions of California and Nevada south of latitude 37° 10' North, and the areas enclosed within a 322-kilometer (200-mile) radius of the Pacific Missile Test Center, Point Mugu, California (latitude 34° 09' North, longitude 119° 11' West).

(e) In the State of Massachusetts within a 160-kilometer (100-mile) radius around locations at Otis Air Force Base, Massachusetts (latitude 41° 45' North, longitude 70° 32' West).

(f) In the State of California within a 240-kilometer (150-mile) radius around locations at Beale Air Force Base, California (latitude 39° 08' North, longitude 121° 26' West).

(g) In the State of Alaska within a 160-kilometer (100-mile) radius of Clear, Alaska (latitude 64° 17' North, longitude 149° 10' West).

(h) In the State of North Dakota within a 160-kilometer (100-mile) radius of Concrete, North Dakota (latitude 48° 43' North, longitude 97° 54' West).

(i) In the States of Alabama, Georgia and South Carolina within a 200-kilometer (124-mile) radius of Warner Robins Air Force Base, Georgia (latitude 32° 38' North, longitude 83° 35' West).

(j) In the State of Texas within a 200-kilometer (124-mile) radius of Goodfellow Air Force Base, Texas (latitude 31° 25' North, longitude 100° 24' West).

US218--The band 902–928 MHz is available for Location and Monitoring Service (LMS) systems subject to not causing harmful interference to the operation of all Government stations authorized in these bands. These systems must tolerate interference from the operation of industrial, scientific, and medical (ISM) devices and the operation of Government stations authorized in these bands.

US220--The frequencies 36.25 and 41.71 MHz may be authorized to Government stations and non-Government stations in the petroleum radio service, for oil spill containment and cleanup operations. The use of these frequencies for oil spill containment or cleanup operations is limited to the inland and coastal waterway regions.

US221--Use of the mobile service in the bands 525-535 kHz and 1605-1615 kHz is limited to distribution of public service information from Travelers Information stations operating on 530 kHz and 1610 kHz.

US222--In the band 2025-2035 MHz geostationary operational environmental satellite earth stations in the space research and Earth exploration-satellite services may be authorized on a coequal basis for Earth-to-space transmissions for tracking, telemetry, and telecommand at the sites listed below:

Wallops Is., Va. 37°50' 48"N., 75°27'33"W.

Seattle, Wash. 47°34'15"N., 122°33' 10"W.

Honolulu, Hawaii 21°21'12"N., 157°52'36"W.

US223--Within 75 miles of the United States/Canada border on the Great Lakes, the St. Lawrence Seaway, and the Puget Sound and the Strait of Juan de Fuca and its approaches, use of coast transmit frequency 162.025 MHz and ship station transmit frequency 157.425 MHz (VHF maritime mobile service Channel 88) may be authorized for use by the maritime service for public correspondence.

US224--Government systems utilizing spread spectrum techniques for terrestrial communication, navigation and identification may be authorized to operate in the band 960-1215 MHz on the condition that harmful interference will not be caused to the aeronautical radionavigation service. These systems will be handled on a case-by-case basis. Such systems shall be subject to a review at the national level for operational requirements and electromagnetic compatibility prior to development, procurement or modification.

US225--In addition to its present Federal Government use, the band 510-525 kHz is available to Federal

and non-Federal Government aeronautical radionavigation stations inland of the Territorial Base Line as coordinated with the military services. In addition, the frequency 510 kHz is available for non-Federal Government ship-helicopter operations when beyond 100 nautical miles from shore and required for aeronautical radionavigation.

US226--In the State of Hawaii, stations in the aeronautical radionavigation service shall not cause harmful interference to U.S. Navy reception from its station at Honolulu on 198 kHz.

US229--In the band 216-220 MHz, the fixed, aeronautical mobile, land mobile, and radiolocation services are allocated on a secondary basis for Government operations. The use of the fixed, aeronautical mobile, and land mobile services shall be limited to telemetering and associated telecommand operations. After January 1, 2002, no new assignments shall be authorized in the band 216-217 MHz. Further, Government and non-Government assignments in the sub-band 216.88-217.08 MHz shall protect the Navy's SPASUR system, which operates on a primary basis at the following sites:

Transmit Frequency of 216.98 MHz			Receive Frequencies of 216.965-216.995 MHz		
Location	North Latitude/ West Longitude	Protection Radius	Location	North Latitude/ West Longitude	Protection Radius
Lake Kickapoo, TX	33° 32' / 098° 45'	250 km	San Diego, CA	32° 34' / 116° 58'	50 km
Jordan Lake, AL	32° 39' / 086° 15'	150 km	Elephant Butte, NM	33° 26' / 106° 59'	50 km
Gila River, AZ	33° 06' / 112° 01'	150 km	Red River, AR	33° 19' / 093° 33'	50 km
			Silver Lake, MO	33° 08' / 091° 01'	50 km
			Hawkinsville, GA	32° 17' / 083° 32'	50 km
			Fort Stewart, GA	31° 58' / 081° 30'	50 km

US230--Non-government land mobile service is allocated on a primary basis in the bands 422.1875-425.4875 and 427.1875-429.9875 MHz within 50 statute miles of Detroit, MI, and Cleveland, OH, and in the bands 423.8125-425.4875 and 428.8125-429.9875 MHz within 50 statute miles of Buffalo, NY.

US231--When an assignment cannot be obtained in the bands between 200 kHz and 525 kHz, which are allocated to aeronautical radionavigation, assignments may be made to aeronautical radiobeacons in the maritime mobile band 435-490 kHz, on a secondary basis, subject to the coordination and agreement of those agencies having assignments within the maritime mobile band which may be affected. Assignments to Federal Government aeronautical radionavigation radiobeacons in the band 435-490 kHz shall not be a bar to any required changes to the maritime mobile radio service and shall be limited to non-voice emissions.

US238--On the condition that harmful interference is not caused to the reception of AM broadcast stations or to travelers' information stations, Federal Government stations in the band 1615-1705 kHz may continue operations until February 25, 2004.

US239--Aeronautical radionavigation stations (radiobeacons) may be authorized, primarily for off-shore use, in the band 525-535 kHz on a non-interference basis to travelers information stations.

US240--The bands 1715-1725 and 1740-1750 kHz are allocated on a primary basis and the bands 1705-1715 kHz and 1725-1740 kHz on a secondary basis to the aeronautical radionavigation service, (radiobeacons).

US244--The band 136-137 MHz is allocated to the non-Federal Government aeronautical mobile (R) service on a primary basis, and is subject to pertinent international treaties and agreements. The frequencies 136, 136.025, 136.05, 136.075, 136.1, 136.125, 136.15, 136.175, 136.2, 136.225, 136.25, 136.275, 136.3, 136.325, 136.35, 136.375, 136.4, 136.425, 136.45, and 136.475 MHz are available on a shared basis to the Federal Aviation Administration for air traffic control purposes, such as automatic weather observation stations (AWOS), automatic terminal information services (ATIS), flight information services-broadcast (FIS-B), and airport control tower communications.

US245--The fixed-satellite service is limited to international inter-continental systems and subject to case-by-case electromagnetic compatibility analysis.

US246 No station shall be authorized to transmit in the following bands:

73-74.6 MHz, 608-614 MHz, except for medical telemetry equipment,[8] 1400-1427 MHz, 1660.5-1668.4 MHz, 2690-2700 MHz, 4990-5000 MHz, 10.68-10.7 GHz, 15.35-15.4 GHz, 23.6-24 GHz, 31.3-31.8 GHz, 50.2-50.4 GHz, 52.6-54.25 GHz, 86-92 GHz, 100-102 GHz, 109.5-111.8 GHz, 114.25-116 GHz, 148.5-151.5 GHz, 164-167 GHz, 182-185 GHz, 190-191.8 GHz, 200-209 GHz, 226-231.5 GHz, 250-252 GHz.

US247--The band 10100-10150 kHz is allocated to the fixed service on a primary basis outside the United States and possessions. Transmissions of stations in the amateur service shall not cause harmful interference to this fixed service use and stations in the amateur service shall make all necessary adjustments (including termination of transmission) if harmful interference is caused.

US251--The band 12.75-13.25 GHz is also allocated to the space research (deep space) (space-to-Earth) service for reception only at Goldstone, California, 35° 18' N. 116° 54' W.

US252--The bands 2110-2120 MHz and 7145-7190 MHz are also allocated for Earth-to-space transmissions in the space research service, limited to deep space communications at Goldstone, California.

US254--In the band 18.6-18.8 GHz the fixed and mobile services shall be limited to a maximum equivalent isotropically radiated power of +35 dBW and the power delivered to the antenna shall not exceed -3 dBW.

US255--In addition to any other applicable limits, the power flux-density across the 200 MHz band 18.6-18.8 GHz produced at the surface of the Earth by emissions from a space station under assumed free-space propagation conditions shall not exceed -95 dB(W/m^2) for all angles of arrival. This limit may be exceeded by up to 3 dB for no more than 5% of the time.

US258--In the band 8025-8400 MHz, the Earth exploration-satellite service (space-to-Earth) is allocated on a primary basis for non-Federal Government use. Authorizations are subject to a case-by-case electromagnetic compatibility analysis.

US259--Stations in the radiolocation service in the band 17.3-17.7 GHz, shall be restricted to operating powers of less than 51 dBW eirp after feeder link stations for the broadcasting-satellite service are authorized and brought into use.

US260--Aeronautical mobile communications which are an integral part of aeronautical radionavigation systems may be satisfied in the bands 1559-1626.5 MHz, 5000-5250 MHz and 15.4-15.7 GHz.

US261--The use of the band 4200-4400 MHz by the aeronautical radionavigation service is reserved exclusively for airborne radio altimeters. Experimental stations will not be authorized to develop equipment for operational use in this band other than equipment related to altimeter stations. However, passive sensing in the Earth-exploration satellite and space research services may be authorized in this band on a secondary basis (no protection is provided from the radio altimeters).

US262--The use of the band 31.8-32.3 GHz by the space research service (deep space) (space-to-Earth) and of the band 34.2-34.7 GHz by the space research service (deep space) (Earth-to-space) are limited to Goldstone, California.

US263--In the bands 21.2-21.4 GHz, 22.21-22.5 GHz, 36-37 GHz, and 56.26-58.2 GHz, the space research and Earth exploration-satellite services shall not receive protection from the fixed and mobile services operating in accordance with the Table of Frequency Allocations.

US264--In the band 48.94-49.04 GHz, airborne stations shall not be authorized.

US265--In the band 10.6-10.68 GHz, the fixed service shall be limited to a maximum equivalent isotropically radiated power of 40 dBW and the power delivered to the antenna shall not exceed -3dBW per 250 kHz.

US266--Licensees in the public safety radio services holding a valid authorization on June 30, 1958, to operate in the frequency band 156.27-157.47 MHz or on the frequencies 161.85, 161.91 or 161.97 MHz may, upon proper application, continue to be authorized for such operation, including expansion of exist-

8. Medical telemetry equipment shall not cause harmful interference to radio astronomy operations in the band 608-614 MHz and shall be coordinated under the requirements found in 47 C.F.R. ß 95.1119.

ing systems, until such time as harmful interference is caused to the operation of any authorized station other than those licensed in the public safety radio service.

US267--In the band 902-928 MHz, amateur radio stations shall not operate within the States of Colorado and Wyoming, bounded by the area of: latitude 39°N. to 42°N. and longitude 103°W. to 108°W.

US268--The bands 890-902 MHz and 928-942 MHz are also allocated to the radiolocation service for Government ship stations (off-shore ocean areas) on the condition that harmful interference is not caused to non-Government land mobile stations. The provisions of footnote US116 apply.

US269-In the band 2655-2690 MHz, radio astronomy observations are performed at the locations listed in US311. Licensees are urged to coordinate their systems through the Electromagnetic Spectrum Management Unit, Division of Astronomical Sciences, National Science Foundation, Room 1030, 4201 Wilson Blvd., Arlington, VA 22230.

US271--The use of the band 17.3-17.8 GHz by the fixed-satellite service (Earth-to-space) is limited to feeder links for broadcasting-satellite service.

US273--In the 74.6-74.8 MHz and 75.2-75.4 MHz bands stations in the fixed and mobile services are limited to a maximum power of 1 watt from the transmitter into the antenna transmission line.

US275--The band 902-928 MHz is allocated on a secondary basis to the amateur service subject to not causing harmful interference to the operations of Government stations authorized in this band or to Location and Monitoring Service (LMS) systems. Stations in the amateur service must tolerate any interference from the operations of industrial, scientific, and medical (ISM) devices, LMS systems, and the operations of Government stations authorized in this band. Further, the amateur service is prohibited in those portions of Texas and New Mexico bounded on the south by latitude 31°41' North, on the east by longitude 104° 11' West, and on the north by latitude 34°30' North, and on the west by longitude 107° 30' West; in addition, outside this area but within 150 miles of these boundaries of White Sands Missile Range the service is restricted to a maximum transmitter peak envelope power output of 50 watts.

US276--Except as otherwise provided for herein, use of the band 2360-2385 MHz by the mobile service is limited to aeronautical telemetering and associated telecommand operations for flight testing of manned or unmanned aircraft, missiles or major components thereof. The following three frequencies are shared on a co-equal basis by Federal Government and non-Federal Government stations for telemetering and associated telecommand operations of expendable and reusable launch vehicles whether or not such operations involve flight testing: 2364.5 MHz, 2370.5 MHz, and 2382.5 MHz. All other mobile telemetering uses shall be secondary to the above uses.

US277--The band 10.6-10.68 GHz is also allocated on a primary basis to the radio astronomy service. However, the radio astronomy service shall not receive protection from stations in the fixed service which are licensed to operate in the one hundred most populous urbanized areas as defined by the 1990 U.S. Census. For the list of observatories operating in this band see 47 C.F.R. § 2.106, footnote US355.

US278--In the bands 22.55-23.55 GHz and 32.3-33 GHz, non-geostationary inter-satellite links may operate on a secondary basis to geostationary inter-satellite links.

US279--The frequency 2182 kHz may be authorized to fixed stations associated with the maritime mobile service for the sole purpose of transmitting distress calls and distress traffic, and urgency and safety signals and messages.

US281--In the band 25070-25210 kHz, non-Federal Government stations in the Industrial/Business Pool shall not cause harmful interference to, and must accept interference from, stations in the maritime mobile service operating in accordance with the Table of Frequency Allocations.

US282--In the band 4650-4700 kHz, frequencies may be authorized for non-Federal Government communication with helicopters in support of off-shore drilling operations on the condition that harmful interference will not be caused to services operating in accordance with the Table of Frequency Allocations.

US283--In the bands 2850-3025 kHz, 3400-3500 kHz, 4650-4700 kHz, 5450-5680 kHz, 6525-6685 kHz, 10005-10100 kHz, 11275-11400 kHz, 13260-13360 kHz, and 17900-17970 kHz, frequencies may be authorized for non-Federal Government flight test purposes on the condition that harmful interference

will not be caused to services operating in accordance with the Table of Frequency Allocations.

US285--Under exceptional circumstances, the carrier frequency 2635, 2638, and 2738 kHz may be authorized to coast stations.

US290--In the band 1900-2000 kHz amateur stations may continue to operate on a secondary basis to the radiolocation service, pending a decision as to their disposition through a future rule making proceeding in conjunction with the implementation of the standard broadcasting service in the 1625-1705 kHz band.

US292--In the band 14.0-14.2 GHz stations in the radionavigation service shall operate on a secondary basis to the fixed-satellite service.

US294--In the spectrum below 490 kHz electric utilities operate Power Line Carrier (PLC) systems on power transmission lines for communications important to the reliability and security of electric service to the public. These PLC systems operate under the provisions of Part 15 of the Federal Communications Commission's Rules and Regulations or Chapter 7 of the National Telecommunications and Information Administration's Manual of Regulations and Procedures for Federal Radio Frequency Management, on an unprotected and noninterference basis with respect to authorized radio users. Notification of intent to place new or revised radio frequency assignments or PLC frequency uses in the bands below 490 kHz is to be made in accordance with the Rules and Regulations of the FCC and NTIA, and users are urged to minimize potential interference to the degree practicable. This footnote does not provide any allocation status to PLC radio frequency uses.

US296--In the bands designated for ship wide-band telegraphy, facsimile and special transmission systems, the following assignable frequencies are available to non-Federal Government stations on a shared basis with Federal Government stations: 2070.5 kHz, 2072.5 kHz, 2074.5 kHz, 2076.5 kHz, 4154 kHz, 4170 kHz, 6235 kHz, 6259 kHz, 8302 kHz, 8338 kHz, 12370 kHz, 12418 kHz, 16551 kHz, 16615 kHz, 18848 kHz, 18868 kHz, 22182 kHz, 22238 kHz, 25123 kHz, and 25159 kHz.

US297--The bands 47.2-49.2 GHz and 81-82.5 GHz are also available for feeder links for the broadcasting-satellite service.

US298--Channels 27555 kHz, 27615 kHz, 27635 kHz, 27655 kHz, 27765 kHz, and 27860 kHz are available for use by forest product licensees on a secondary basis to Federal Government operations including experimental stations. Non-Federal Government operations on these channels will not exceed 150 watts output power and are limited to the states of Washington, Oregon, Maine, North Carolina, South Carolina, Tennessee, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas (eastern portion).

US299--The 1615-1705 kHz band in Alaska is also allocated to the maritime mobile services and the Alaska fixed service on a secondary basis to Region 2 broadcast operations.

US300--The frequencies 169.445, 169.505, 170.245, 170.305, 171.045, 171.105, 171.845 and 171.905 MHz are available for wireless microphone operations on a secondary basis to Government and non-Government operations.

US301--Except as provided in US302, broadcast auxiliary stations licensed as of November 21, 1984, to operate in the band 942-944 MHz may continue to operate on a co-equal primary basis to other stations and services operating in the band in accordance with the Table of Frequency Allocations.

US302--The band 942-944 MHz in Puerto Rico is allocated as an alternative allocation to the fixed service for broadcast auxiliary stations only.

US303--In the band 2285-2290 MHz, non-Federal government space stations in the space research, space operations and Earth exploration-satellite services may be authorized to transmit to the Tracking and Data Relay Satellite System subject to such conditions as may be applied on a case-by-case basis. Such transmissions shall not cause harmful interference to authorized Federal Government stations. The power flux density at the Earth's surface from such non-Federal Government stations shall not exceed -144 to -154 dBW/m^2/4 kHz, depending on angle of arrival, in accordance with ITU Radio Regulation **21.16**.

US307--The sub-band 5150-5216 MHz is also allocated for space-to-Earth transmissions in the fixed satellite service for feeder links in conjunction with the radiodetermination satellite service operating in the bands 1610-1626.5 MHz and 2483.5-2500 MHz. The total power flux density at the Earth's surface shall

in no case exceed -159 dBW/m^2 per 4 kHz for all angles of arrival.

US308--In the frequency bands 1549.5-1558.5 MHz and 1651-1660 MHz, the Aeronautical-Mobile- Satellite (R) requirements that cannot be accommodated in the 1545-1549.5 MHz, 1558.5-1559 MHz, 1646.5-1651 MHz and 1660-1660.5 MHz bands shall have priority access with real-time preemptive capability for communications in the mobile-satellite service. Systems not interoperable with the aeronautical mobile-satellite (R) service shall operate on a secondary basis. Account shall be taken of the priority of safety-related communications in the mobile-satellite service.

US309--Transmissions in the bands 1545-1559 MHz from terrestrial aeronautical stations directly to aircraft stations, or between aircraft stations, in the aeronautical mobile (R) service are also authorized when such transmissions are used to extend or supplement the satellite-to-aircraft links. Transmissions in the band 1646.5-1660.5 MHz from aircraft stations in the aeronautical mobile (R) service directly to terrestrial aeronautical stations, or between aircraft stations, are also authorized when such transmissions are used to extend or supplement the aircraft-to-satellite links.

US310--In the band 14.896-15.121 GHz, non-Federal Government space stations in the space research service may be authorized on a secondary basis to transmit to Tracking and Data Relay Satellites subject to such conditions as may be applied on a case-by-case basis. Such transmissions shall not cause harmful interference to authorized Federal Government stations. The power flux-density produced by such non-Federal Government stations at the Earth's surface in any 4 kHz band for all conditions and methods of modulation shall not exceed:

-148 dB(W/m^2) for $0° < \theta \leq 5°$

$-148 + (\theta - 5)/2$ dB(W/m^2) for $5° < \theta \leq 25°$

-138 dB(W/m^2) for $25° < \theta \leq 90°$

where θ is the angle of arrival of the radio-frequency wave (degrees above the horizontal). These limits relate to the power flux-density and angles of arrival which would be obtained under free-space propagation conditions.

US311--Radio astronomy observations may be made in the bands 1350-1400 MHz, 1718.8-1722.2 MHz, and 4950-4990 MHz on an unprotected basis at the following radio astronomy observatories:

Allen Telescope Array, Hat Creek, California	Rectangle between latitudes 40° 00' N and 42° 00' N and between longitudes 120° 15' W and 122° 15' W.	
NASA Goldstone Deep Space Communications Complex, Goldstone, California	80 kilometers (50 mile) radius centered on latitude 35° 18' N, longitude 116° 54' W.	
National Astronomy and Ionosphere Center, Arecibo, Puerto Rico	Rectangle between latitudes 17° 30' N and 19° 00' N and between longitudes 65° 10' W and 68° 00' W.	
National Radio Astronomy Observatory, Socorro, New Mexico	Rectangle between latitudes 32° 30' N and 35° 30' N and between longitudes 106° 00' W and 109° 00' W.	
National Radio Astronomy Observatory, Green Bank, West Virginia	Rectangle between latitudes 37° 30' N and 39° 15' N and between longitudes 78° 30' W and 80° 30' W.	
National Radio Astronomy Observatory, Very Long Baseline Array Stations	80 kilometer radius centered on:	
	Latitude (North)	Longitude (West)
Brewster, WA	48° 08'	119° 41'
Fort Davis, TX	30° 38'	103° 57'
Hancock, NH	42° 56'	71° 59'
Kitt Peak, AZ	31° 57'	111° 37'
Los Alamos, NM	35° 47'	106° 15'
Mauna Kea, HI	19° 48'	155° 27'
North Liberty, IA	41° 46'	91° 34'

Owens Valley, CA	37° 14'	118° 17'
Pie Town, NM	34° 18'	108° 07'
Saint Croix, VI	17° 46'	64° 35'
Owens Valley Radio Observatory, Big Pine, California	Two contiguous rectangles, one between latitudes 36° 00' N and 37° 00' N and between longitudes 117° 40' W and 118° 30' W and the second between latitudes 37° 00' N and 38° 00' N and between longitudes 118° 00' W and 118° 50' W.	

In the bands 1350-1400 MHz and 4950-4990 MHz, every practicable effort will be made to avoid the assignment of frequencies to stations in the fixed and mobile services that could interfere with radio astronomy observations within the geographic areas given above. In addition, every practicable effort will be made to avoid assignment of frequencies in these bands to stations in the aeronautical mobile service which operate outside of those geographic areas, but which may cause harmful interference to the listed observatories. Should such assignments result in harmful interference to these observatories, the situation will be remedied to the extent practicable.

US312--The frequency 173.075 MHz may also be authorized on a primary basis to non-Government stations in the Police Radio Service (with a maximum authorized bandwidth of 20 kHz) for stolen vehicle recovery systems.

US315--In the frequency bands 1530-1544 MHz and 1626.5-1645.5 MHz maritime mobile-satellite distress and safety communications, *e.g.*, GMDSS, shall have priority access with real-time preemptive capability in the mobile-satellite service. Communications of mobile-satellite system stations not participating in the GMDSS shall operate on a secondary basis to distress and safety communications of stations operating in the GMDSS. Account shall be taken of the priority of safety-related communications in the mobile-satellite service.

US316--The band 2900-3100 MHz is also allocated on a primary basis to the meteorological aids service. Operations in this service are limited to Federal Government Next Generation Weather Radar (NEXRAD) systems where accommodation in the 2700-2900 MHz band is not technically practical and are subject to coordination with existing authorized stations.

US319--In the bands 137-138 MHz, 148-149.9 MHz, 149.9-150.05 MHz, 399.9-400.05 MHz, 400.15-401 MHz, 1610-1626.5 MHz, and 2483.5-2500 MHz, Federal government stations in the mobile-satellite service shall be limited to earth stations operating with non-Federal government space stations.

US320--The use of the bands 137-138 MHz, 148-150.05 MHz, and 400.15-401 MHz by the mobile-satellite service is limited to non-voice, non-geostationary satellite systems and may include satellite links between land earth stations at fixed locations.

US321--The band 535-1705 kHz is also allocated to the non-Federal Government mobile service on a secondary basis for the distribution of public service information from Travelers' Information Stations operating in accordance with the provisions of 47 C.F.R. § 90.242 on 10 kilohertz spaced channels from 540 kHz to 1700 kHz.

US323--In the 148-149.9 MHz band, no individual mobile earth station shall transmit, on the same frequency being actively used by fixed and mobile stations and shall transmit no more than 1% of the time during any 15 minute period; except, individual mobile earth stations in this band that do not avoid frequencies actively being used by the fixed and mobile services shall not exceed a power density of -16 dBW/4 kHz and shall transmit no more than 0.25% of the time during any 15 minute period. Any single transmission from any individual mobile earth station operating in this band shall not exceed 450 ms in duration and consecutive transmissions from a single mobile earth station on the same frequency shall be separated by at least 15 seconds. Land earth stations in this band shall be subject to electromagnetic compatibility analysis and coordination with terrestrial fixed and mobile stations.

US324--Government and non-Government satellite systems in the 400.15-401 MHz band shall be subject to electromagnetic compatibility analysis and coordination.

US325--In the band 148-149.9 MHz fixed and mobile stations shall not claim protection from land earth

stations in the mobile-satellite service that have been previously coordinated; Government fixed and mobile stations exceeding 27 dBW EIRP, or an emission bandwidth greater than 38 kHz, will be coordinated with existing mobile-satellite service space stations.

US327--The band 2310-2360 MHz is allocated to the broadcasting-satellite service (sound) and complementary terrestrial broadcasting service on a primary basis. Such use is limited to digital audio broadcasting and is subject to the provisions of Resolution **528**.

US334--In the band 17.8-20.2 GHz, Government space stations in both geostationary (GSO) and non-geostationary satellite orbits (NGSO) and associated earth stations in the fixed-satellite service (space-to-Earth) may be authorized on a primary basis. For a Government geostationary satellite network to operate on a primary basis, the space station shall be located outside the arc, measured from east to west, 70 West Longitude to 120 West Longitude. Coordination between Government fixed-satellite systems and non-Government space and terrestrial systems operating in accordance with the United States Table of Frequency Allocations is required.

(a) In the sub-band 17.8-19.7 GHz, the power flux-density at the surface of the Earth produced by emissions from a Government GSO space station or from a Government space station in a NGSO constellation of 50 or fewer satellites, for all conditions and for all methods of modulation, shall not exceed the following values in any 1 MHz band:

(1) -115 dB(W/m^2) for angles of arrival above the horizontal plane (δ) between 0° and 5°,

(2) -115 + 0.5(δ - 5) dB(W/m^2) for δ between 5° and 25°, and

(3) -105 dB(W/m^2) for δ between 25° and 90°.

(b) In the sub-band 17.8-19.3 GHz, the power flux-density at the surface of the Earth produced by emissions from a Government space station in an NGSO constellation of 51 or more satellites, for all conditions and for all methods of modulation, shall not exceed the following values in any 1 MHz band:

(1) -115 - X dB(W/m^2) for δ between 0° and 5°,

(2) -115 - X + ((10 + X)/20)(δ - 5) dB(W/m^2) for δ between 5° and 25°, and

(3) -105 dB(W/m^2) for d between 25° and 90°; where X is defined as a function of the number of satellites, n, in an NGSO constellation as follows:

For $n \leq 288$, $X = (5/119)(n - 50)$ dB; and

For $n > 288$, $X = (1/69)(n + 402)$ dB.

US335--The primary Government and non-Government allocations for the various segments of the 220-222 MHz band are divided as follows: (1) the 220.0-220.55/221.0-221.55, 220.6-220.8/221.6-221.8, 220.85-220.90/221.85-221.90 and 220.925-221.0/221.925-222.0 MHz bands (Channels 1-110, 121-160, 171-180 and 186-200, respectively) are available for exclusive non-Government use; (2) the 220.55-220.60/221.55-221.60 MHz bands (Channels 111-120) are available for exclusive Government use; and (3) the 220.80-220.85/221.80-221.85 and 220.900-220.925/221.900-221.925 MHz bands (Channels 161-170 and 181-185, respectively) are available for shared Government and non-Government use. The exclusive non-Government band segments are also available for temporary fixed geophysical telemetry operations on a secondary basis to the fixed and mobile services.

US337--In the band 13.75-13.80 GHz, earth stations in the fixed-satellite service shall be coordinated on a case-by-case basis through the frequency assignment subcommittee in order to minimize harmful interference to the Tracking and Data Relay Satellite System's forward space-to-space link (TDRSS forward link-to-LEO).

US338--In the 2305-2310 MHz band, space-to-Earth operations are prohibited. Additionally, in the 2305-2320 MHz band, all Wireless Communications Service (WCS) operations within 50 kilometers of 35°20′ North Latitude and 116° 53′ West Longitude shall be coordinated through the Frequency Assignment Subcommittee of the Interdepartment Radio Advisory Committee in order to minimize harmful interference to NASA's Goldstone Deep Space facility.

US339--The bands 2310-2320 and 2345-2360 MHz are also available for aeronautical telemetering and

associated telecommand operations for flight testing of manned or unmanned aircraft, missiles or major components thereof on a secondary basis to the Wireless Communications Service. The following two frequencies are shared on a co-equal basis by Government and non-Government stations for telemetering and associated telecommand operations of expendable and re-usable launch vehicles whether or not such operations involve flight testing: 2312.5 and 2352.5 MHz. Other mobile telemetering uses may be provided on a non-interference basis to the above uses. The broadcasting-satellite (sound) service during implementation should also take cognizance of the expendable and reusable launch vehicle frequencies 2312.5 and 2352.5 MHz, to minimize the impact on this mobile service use to the extent possible.

US340--The 2-30 MHz band is available on a secondary noninterference basis to Government and non-Government maritime and aeronautical stations for the purposes of measuring the quality of reception on radio channels. See 47 C.F.R. § 87.149 for the list of protected frequencies and bands within this frequency range. Actual communications shall be limited to those frequencies specifically allocated to the maritime mobile and aeronautical mobile services.

US342--In making assignments to stations of other services to which the bands:

13360-13410 kHz	14.47-14.5 GHz	128.33-128.59 GHz
25550-25670 kHz	22.01-22.21 GHz	129.23-129.49 GHz
37.5-38.25 MHz	22.21-22.5 GHz	130-134 GHz
322-328.6 MHz	22.81-22.86 GHz	136-148.5 GHz
1330-1400 MHz	23.07-23.12 GHz	151.5-158.5 GHz
1610.6-1613.8 MHz	31.2-31.3 GHz	168.59-168.93 GHz
1660-1660.5 MHz	36.43-36.5 GHz	171.11-171.45 GHz
1668.4-1670 MHz	42.5-43.5 GHz	172.31-172.65 GHz
3260-3267 MHz	48.94-49.04 GHz	173.52-173.85 GHz
3332-3339 MHz	76-86 GHz	195.75-196.15 GHz
3345.8-3352.5 MHz	92-94 GHz	209-226 GHz
4825-4835 MHz	94.1-100 GHz	241-250 GHz
4950-4990 MHz	102-109.5 GHz	252-275 GHz
6650-6675.2 MHz	111.8-114.25 GHz	

are allocated, all practicable steps shall be taken to protect the radio astronomy service from harmful interference. Emissions from spaceborne or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 4.5 and 4.6 and Article **29** of the ITU Radio Regulations).

US343--Differential-Global-Positioning-System (DGPS) Stations, limited to ground-based transmitters, may be authorized on a primary basis in the bands 108-117.975 and 1559-1610 MHz for the specific purpose of transmitting DGPS information intended for aircraft navigation. Such use shall be in accordance with ITU Resolution **413 (WRC-03)**.

US344--In the band 5091-5250 MHz, non-Government earth stations in the fixed-satellite service (Earth-to-space) shall be coordinated through the Frequency Assignment Subcommittee (see Recommendation ITU-R S.1342). In order to better protect the operation of the international standard system (microwave landing system) in the band 5000-5091 MHz, non-Government tracking and telecommand operations should be conducted in the band 5150-5250 MHz.

US345--In the band 402-405 MHz, the mobile, except aeronautical mobile, service is allocated on a secondary basis and is limited to, with the exception of military tactical mobile stations, Medical Implant Communications Service (MICS) operations. MICS stations are authorized by rule on the conditions that harmful interference is not caused to stations in the meteorological aids, meteorological-satellite, and Earth exploration-satellite services, and that MICS stations accept interference from stations in the meteorological aids, meteorological-satellite, and Earth exploration-satellite services.

US346--Except as provided by footnote US222, the use of the band 2025-2110 MHz by the Government space operation service (Earth-to-space), Earth exploration-satellite service (Earth-to-space), and space

research service (Earth-to-space) shall not constrain the deployment of the Television Broadcast Auxiliary Service, the Cable Television Relay Service, or the Local Television Transmission Service. To facilitate compatible operations between non-Government terrestrial receiving stations at fixed sites and Government earth station transmitters, coordination is required. To facilitate compatible operations between non-government terrestrial transmitting stations and Government spacecraft receivers, the terrestrial transmitters shall not be high-density systems (see Recommendations ITU-R SA.1154 and ITU-R F.1247).

US347--In the band 2025-2110 MHz, non-Government Earth-to-space and space-to-space transmissions may be authorized in the space research and Earth exploration-satellite services subject to such conditions as may be applied on a case-by-case basis. Such transmissions shall not cause harmful interference to Government and non-Government stations operating in accordance with the Table of Frequency Allocations.

US348--The band 3650-3700 MHz is also allocated to the Government radiolocation service on a primary basis at the following sites: St. Inigoes, MD (38° 10'N, 76° 23'W); Pascagoula, MS (30° 22'N, 88° 29'W); and Pensacola, FL (30° 21' 28''N, 87° 16' 26''W). All fixed and fixed satellite operations within 80 kilometers of these sites shall be coordinated through the Frequency Assignment Subcommittee of the Interdepartment Radio Advisory Committee on a case-by-case basis.

US349--The band 3650-3700 MHz is also allocated to the Government radiolocation service on a non-interference basis for use by ship stations located at least 44 nautical miles in off-shore ocean areas on the condition that harmful interference is not caused to non-Government operations.

US350--In the bands 608-614 MHz and 1395-1400 MHz the Government and non-Government land mobile service is limited to medical telemetry and medical telecommand operations. Availability and use of medical telemetry and telecommand and non-medical telemetry and telecommand in the band 1427-1432 MHz are described below:

Location (see §§ 90.259(b)(4) and 95.630(b) of this chapter for a detailed description)	1427-1429 MHz 1431.5-1432 MHz	1429-1431.5 MHz
Austin/Georgetown, Texas	Non-Government land mobile service is limited to telemetry and telecommand operations.	Government and non-Government land mobile service is limited to medical telemetry and telecommand operations. Non-Government telemetry and telecommand use is permitted on a secondary basis.
Battle Creek, Michigan		
Detroit, Michigan		
Pittsburgh, Pennsylvania		
Richmond/Norfolk, Virginia		
Spokane, Washington		
Washington, DC metropolitan area		

Location	1427-1429.5 MHz	1429.5-1432 MHz
Rest of U.S.	Government and non-Government land mobile service is limited to medical telemetry and telecommand operations. Non-Government telemetry and telecommand use is permitted on a secondary basis.	Non-Government land mobile service is limited to telemetry and telecommand operations.

US351--In the band 1390-1400 MHz, Government operations, except for medical telemetry operations in the sub-band 1395-1400 MHz, are on a non-interference basis to authorized non-Government operations

and shall not hinder implementation of any non-Government operations. However, Government operations authorized as of March 22, 1995 at 17 sites identified below will be continued on a fully protected basis until January 1, 2009.

Sites	Lat/Long	Radius(km)	Sites	Lat/Long	Radius(km)
Eglin AFB, FL	30°28'N/086°31'W	80	Ft. Greely, AK	63°47'N/145°52'W	80
Dugway PG, UT	40°11'N/112°53'W	80	Ft. Rucker, AL	31°13'N/085°49'W	80
China Lake, CA	35°41'N/117°41'W	80	Redstone, AL	34°35'N/086°35'W	80
Ft. Huachuca, AZ	31°33'N/110°18'W	80	Utah Test Range, UT	40°57'N/113°05'W	80
Cherry Point, NC	34°57'N/076°56'W	80	WSM Range, NM	32°10'N/106°21'W	80
Patuxent River, MD	38°17'N/076°25'W	80	Holloman AFB, NM	33°29'N/106°50'W	80
Aberdeen PG, MD	39°29'N/076°08'W	80	Yuma, AZ	32°29'N/114°20'W	80
Wright-Patterson AFB, OH	39°50'N/084°03'W	80	Pacific Missile Range, CA	34°07'N/119°30'W	80
Edwards AFB, CA	34°54'N/117°53'W	80			

US352--In the band 1427-1432 MHz, Government operations, except for medical telemetry and medical telecommand operations, are on a non-interference basis to authorized non-Government operations and shall not hinder the implementation of any non-Government operations. However, Government operations authorized as of March 22, 1995 at the 14 sites identified below may continue on a fully protected basis until January 1, 2004:

Location	North Latitude/ West Longitude	Operating Radius	Location	North Latitude/ West Longitude	Operating Radius
Patuxent River, MD	38º 17' / 076º 25'	70 km	Mountain Home AFB, ID	43º 01' / 115º 50'	160 km
NAS Oceana, VA	36º 49' / 076º 02'	100 km	NAS Fallon, NV	39º 24' / 118º 43'	100 km
MCAS Cherry Point, NC	34º 54' / 076º 52'	100 km	Nellis AFB, NV	36º 14' / 115º 02'	100 km
Beaufort MCAS, SC	32º 26' / 080º 40'	160 km	NAS Lemore, CA	36º 18' / 119º 47'	120 km
NAS Cecil Field, FL	30º 13' / 081º 52'	160 km	Yuma MCAS, AZ	32º 39' / 114º 35'	160 km
NAS Whidbey IS., WA	48º 19'/122º 24'	70 km	China Lake, CA	35º29' / 117º 16'	80 km
Yakima Firing Ctr AAF, WA	46º 40' / 120º15'	70 km	MCAS Twenty Nine Palms, CA	34º 15'/ 116º03'	80 km

US353--In the sub-bands 56.24-56.29 GHz, 58.422-58.472 GHz, 59.139-59.189 GHz, 59.566-59.616 GHz, 60.281-60.331 GHz, 60.41-60.46 GHz, and 62.461-62.511 GHz, space-based radio astronomy observations may be made on an unprotected basis.

US354--In the sub-band 58.422-58.472 GHz, airborne stations and space stations in the space-to-Earth direction shall not be authorized.

US355--In the band 10.7-11.7 GHz, non-geostationary satellite orbit licensees in the fixed-satellite service (space-to-Earth), prior to commencing operations, shall coordinate with the following radio astronomy observatories to achieve a mutually acceptable agreement regarding the protection of the radio telescope facilities operating in the band 10.6-10.7 GHz:

Observatory	West Longitude	North Latitude	Elevation
Arecibo Observatory	……66° 45' 11"	….18° 20' 46"	…..…….496 m
Green Bank Telescope (GBT)	..…79° 50' 24"	….38° 25' 59"	…..…….825 m
Very Large Array (VLA)	…..107° 37' 04"	….34° 04' 44"	……..…2126 m

Very Long Baseline Array (VLBA) Stations:			
Brewster, WA	…..119° 40' 55"	….48° 07' 53"	…..……..255 m
Fort Davis, TX	..…103° 56' 39"	….30° 38' 06"	…..……1615 m
Hancock, NH.	……..71° 59' 12"	….42° 56' 01"	…..…….309 m
Kitt Peak, AZ	…..111° 36' 42"	….31° 57' 22"	…..…..…1916 m
Los Alamos, NM	..…106° 14' 42"	….35° 46' 30"	…..……1967 m
Mauna Kea, HI	…..155° 27' 29"	….19° 48' 16"	…..……3720 m
North Liberty, IA	..….91° 34' 26"	….41° 46' 17"	…..……..241 m
Owens Valley, CA	…..118° 16' 34"	….37° 13' 54"	…..……1207 m
Pie Town, NM	…..108° 07' 07"	….34° 18' 04"	…..……2371 m
St. Croix, VI…….....	……64° 35' 03"	….17° 45' 31"	…..……16 m

US356--In the band 13.75-14 GHz, an earth station in the fixed-satellite service shall have a minimum antenna diameter of 4.5 m and the e.i.r.p. of any emission should be at least 68 dBW and should not exceed 85 dBW. In addition, the e.i.r.p., averaged over one second, radiated by a station in the radiolocation service towards the geostationary-satellite orbit shall not exceed 59 dBW. Receiving space stations in the fixed-satellite service shall not claim protection from radiolocation transmitting stations operating in accordance with the United States Table of Frequency Allocations. ITU Radio Regulation No. **5.43A** does not apply.

US357--In the band 13.75-14 GHz, geostationary space stations in the space research service for which information for advance publication has been received by the ITU Radiocommunication Bureau (Bureau) prior to 31 January 1992 shall operate on an equal basis with stations in the fixed-satellite service; after that date, new geostationary space stations in the space research service will operate on a secondary basis. Until those geostationary space stations in the space research service for which information for advance publication has been received by the Bureau prior to 31 January 1992 cease to operate in this band:

a) the e.i.r.p. density of emissions from any earth station in the fixed-satellite service operating with a space station in geostationary-satellite orbit shall not exceed 71 dBW in any 6 MHz band from 13.77 to 13.78 GHz;

b) the e.i.r.p. density of emissions from any earth station in the fixed-satellite service operating with a space station in non-geostationary-satellite orbit shall not exceed 51 dBW in any 6 MHz band from 13.77 to 13.78 GHz.

Automatic power control may be used to increase the e.i.r.p. density in any 6 MHz band in these frequency ranges to compensate for rain attenuation, to the extent that the power flux-density at the fixed-satellite service space station does not exceed the value resulting from use by an earth station of an e.i.r.p. of 71 dBW or 51 dBW, as appropriate, in any 6 MHz band in clear-sky conditions.

US359--In the band 15.43-15.63 GHz, use of the fixed-satellite service (Earth-to-space) is limited to non-Government feeder links of non-geostationary systems in the mobile-satellite service. These non-Government earth stations shall be coordinated through the Frequency Assignment Subcommittee (see Annex 3 of Recommendation ITU-R S.1340).

US360--In the band 33-36 GHz, the Government fixed-satellite service (space-to-Earth) is also allocated on a primary basis. Coordination between Government fixed-satellite service systems and non-Government systems operating in accordance with the United States Table of Frequency Allocations is required.

US361--In the band 1432-1435 MHz, Government stations in the fixed and mobile services may operate indefinitely on a primary basis at the 23 sites listed below. All other Government stations in the fixed and mobile services shall operate in the band 1432-1435 MHz on a primary basis until reaccommodated in accordance with the National Defense Authorization Act of 1999.

Location	North Latitude/ West Longitude	Operating Radius	Location	North Latitude/ West Longitude	Operating Radius
China Lake Edwards AFB, CA	35° 29" / 117° 16'	100 km	AUTEC	24° 30' / 078° 00'	80 km

White Sands Missile Range / Holloman AFB, NM	32° 11' / 106° 20'	160 km	Beaufort MCAS, SC	32° 26' / 080° 40'	160 km
Utah Test and Training Range / Dugway Proving Ground, Hill AFB, UT	40° 57' / 113° 05'	160 km	MCAS Cherry Point, NC	34° 54' / 076° 53'	100 km
Patuxent River, MD	38° 17' / 076° 24'	70 km	NAS Cecil Field, FL	30° 13' / 081° 52'	160 km
Nellis AFB, NV	37° 29' / 114° 14'	130 km	NAS Fallon, NV	39° 30' / 118° 46'	100 km
Fort Huachuca, AZ	31° 33' / 110° 18'	80 km	NAS Oceana, VA	36° 49' / 076° 01'	100 km
Eglin AFB / Gulfport ANG Range, MS / Fort Rucker, AL	30° 28' / 086° 31'	140 km	NAS Whidbey Island, WA	48° 21' / 122° 39'	70 km
Yuma Proving Ground, AZ	32° 29' / 114° 20'	160 km	NCTAMS, GUM	13° 35' / 144° 51' (East)	80 km
Fort Greely, AK	63° 47' / 145° 52'	80 km	Lemoore, CA	36° 20' / 119° 57'	120 km
Redstone Arsenal, AL	34° 35' / 086° 35'	80 km	Savannah River, SC	33° 15' / 081° 39'	3 km
Alpene Range, MI	44° 23' / 083° 20'	80 km	Naval Space Operations Center, ME	44° 24' / 068° 01'	80 km
Camp Shelby, MS	31° 20' / 089° 18'	80 km			

US362--The band 1670-1675 MHz is allocated to the meteorological-satellite service (space-to-Earth) on a primary basis for Government use. Earth station use of this allocation is limited to Wallops Island, VA (37°56'47''N, 75°27'37''W), Fairbanks, AK (64°58'36''N, 147°31'03''W), and Greenbelt, MD (39°00'02''N, 76°50'31''W). Applicants for non-Government stations within 100 kilometers of the Wallops Island or Fairbanks coordinates and within 65 kilometers of the Greenbelt coordinates shall notify NOAA in accordance with the procedures specified in 47 C.F.R. § 1.924.

US363--Until January 1, 2005, the band 2385-2390 MHz is allocated to the Government mobile and radiolocation services on a primary basis and to the Government fixed service on a secondary basis. Use of the mobile service is limited to aeronautical telemetry and associated telecommand operations for flight testing of manned or unmanned aircraft, missiles or major components thereof. Use of the radiolocation service is limited to the military services.

After January 1, 2005, Government stations in the mobile and radiolocation services shall continue to operate on a primary basis until re-accommodated in accordance with the National Defense Authorization Act of 1999, except at the sites identified below where Government stations may not be reaccommodated until January 1, 2007:

Protection Radius for Each of the Following Sites is 160 km:			
Location	North Latitude/West Longitude	Location	North Latitude/West Longitude
Barking Sands, HI	22° 07'/ 159° 40'	Roswell, NM	33° 18' / 104° 32'
Cape Canaveral, FL	28° 33'/ 080° 34'	Seattle, WA	47° 32' / 122° 18'
China Lake, CA	35° 40' / 117° 41'	St. Louis, MO	38° 45' / 090° 22'
Eglin AFB, FL	30° 30' / 086° 30'	Utah Test Range, UT	40° 12' / 112° 54'
Glasgow, MT	48° 25' / 106° 32'	White Sands Missile Range, NM	32°58' / 106° 23'
Nellis AFB, NV	37° 48' / 116° 28'	Wichita, KS	37° 40' / 097° 26'
Palm Beach County, FL	26° 54' / 080° 19'	Yuma Proving Ground, AZ	32° 54' / 114° 20'
Roosevelt Roads, PR	18° 14' / 065° 38'		
Protection Radius for Each of the Following Sites is 100 km:			
Edwards AFB, CA	34° 54' / 117° 53'	Patuxent River, MD	38° 17' / 076° 25'

In addition, non-Government flight test operations may continue at the sites identified below on a primary basis until January 1, 2007:

Protection Radius for Each of the Following Sites is 160 km:			
Location	**North Latitude/West Longitude**	**Location**	**North Latitude/West Longitude**
Alammosa, CO	37º 26" 04" / 105º 52' 03	Thermal, CA	33º 37' 35" / 116º 09' 36"
Albuquerque, NM	35º 11' 03" / 106º 34' 30"	Phoenix, AZ	33º 18' 28" / 111º 39' 19"
Amarillo, TX	35º 12' 49" / 101º 42' 31	Marietta, GA	33º 54' 24" / 084º 31' 09"
Arlington, TX	32º 40' 00" / 097º 05' 53"	Greenville, TX	33º 04' 01" / 096º 03' 09"
Leadville, CO	39º 13' 13" / 106º 19' 03"		

US364--Consistent with US18, stations may be authorized on a primary basis in the band 285-325 kHz for the specific purpose of transmitting differential global positioning system information.

US366--On April 1, 2007, the bands 5900-5950 kHz, 7300-7350 kHz, 9400-9500 kHz, 11600-11650 kHz, 12050-12100 kHz, 13570-13600 kHz, 13800-13870 kHz, 15600-15800 kHz, 17480-17550 kHz, and 18900-19020 kHz shall be allocated exclusively to the broadcasting service. Beginning April 1, 2007, frequencies in these bands may be used by stations in the fixed and mobile services, communicating only within the United States and its insular areas, on the condition that harmful interference is not caused to the broadcasting service. When using frequencies for fixed and mobile services, licensees shall be limited to the minimum power needed to achieve communications and shall take account of the seasonal use of frequencies by the broadcasting service published in accordance with Article **12** of the ITU *Radio Regulations*.

US367--On the condition that harmful interference is not caused to the broadcasting service, frequencies in the bands 9775-9900 kHz, 11650-11700 kHz, and 11975-12050 kHz may be used by Federal Government stations in the fixed service communicating within the United States and its insular areas that are authorized as of [effective date of the Report and Order published in the Federal Register]. Each such station shall be limited to a total radiated power of 24 dBW.

US368--The band 1390-1392 MHz is also allocated to the fixed-satellite service (Earth-to-space) on a primary basis and the band 1430-1432 MHz is also allocated to the fixed-satellite service (space-to-Earth) on a primary basis, limited to feeder links for the Non-Voice Non-Geostationary Mobile-Satellite Service, and contingent on (1) the completion of sharing studies including the measurement of emissions from equipment that would be employed in operational systems and demonstrations to validate the studies as called for in Resolution 127 (WRC-2000), (2) the adoption of worldwide feeder link allocations at the 2003 World Radiocommunication Conference (WRC-03), and (3) compliance with any technical and operational requirements that may be imposed at WRC-03 to protect passive services in the 1400-1427 MHz band from unwanted emissions associated with such allocations. These allocations become effective upon adoption of worldwide allocations at WRC-03. If no such allocations are adopted by WRC-03, these allocations shall be considered null and void, with no grandfathering of rights. Individual assignments shall be coordinated with the Interdepartmental Radio Advisory Committee's (IRAC) Frequency Assignment Subcommittee (FAS) (see, for example, Recommendations ITU-R RA.769-1 and ITU R SA.1029-1) to ensure the protection of passive services in the 1400-1427 MHz band. Coordination shall not be completed until the feeder downlink system is tested and certified to be in conformance with the technical and operational requirements for the protection of passive services in the 1400-1427 MHz band. Certification and all supporting documentation shall be submitted to the Commission and FAS prior to launch.

US370--The band 5000-5150 MHz is to be used for the operation of the international standard system (microwave landing system) for precision approach and landing. The requirements of this system shall take precedence over other uses of this band. For the use of this band, ITU Radio Regulation No.

5.444A and Resolution **114** (WRC-95) apply.

US378--In the band 1710-1755 MHz, Federal Government stations in the fixed and mobile services shall operate on a primary basis until reaccommodated in accordance with the Strom Thurmond National Defense Authorization Act for Fiscal Year 1999. Further, Federal Government stations may continue to operate in the band 1710-1755 MHz as provided below:

(a) Federal fixed microwave and tactical radio relay stations may operate indefinitely on a primary basis at the sites listed below:

Location	Coordinates	Radius of Operation (km)
Cherry Point, NC	34°58'N 076°56'W	80
Yuma, AZ	32°32'N 113°58'W	80

(b) Federal fixed microwave and tactical radio relay stations may operate on a secondary basis, and shall not cause harmful inference to, and must accept harmful interference from, primary non-Federal Government operations at the sites listed below:

Location	Coordinates	Radius of Operation (km)
China Lake, CA	35°41'N 117°41'W	80
Eglin AFB, FL	30°29'N 086°31'W	80
Pacific Missile Test Range/Point Mugu, CA.	34°07'N 119°30'W	80
Nellis AFB, NV	36°14'N 115° 02'W	80
Hill AFB, UT	41°07'N 111°58'W	80
Patuxent River, MD	38°17'N 076°25'W	80
White Sands Missile Range, NM	33°00'N 106°30'W	80
Fort Irwin, CA	35°16'N 116°41'W	50
Fort Rucker, AL	31°13'N 085°49'W	50
Fort Bragg, NC	35°09'N 079°01'W	50
Fort Campbell, KY	36°41'N 087°28'W	50
Fort Lewis, WA	47°05'N 122°36'W	50
Fort Benning, GA	32°22'N 084°56'W	50
Fort Stewart, GA.	31°52'N 081°37'W	50

(c) In the sub-band 1710-1720 MHz, precision guided munitions shall operate on a primary basis until inventory is exhausted or until December 31, 2008, whichever is earlier.

US379--In the band 55.78-56.26 GHz, in order to protect stations in the Earth exploration-satellite service (passive), the maximum power density delivered by a transmitter to the antenna of a fixed service station is limited to -28.5 dB(W/MHz).

US380--In the bands 1525-1544 MHz, 1545-1559 MHz, 1610-1645.5 MHz, 1646.5-1660.5 MHz, 2000-2020 MHz, 2180-2200 MHz, and 2483.5-2500 MHz, a non-Federal Government licensee in the mobile-satellite service (MSS) may also operate an ancillary terrestrial component in conjunction with its MSS network, subject to the Commission's rules for ancillary terrestrial components and subject to all applicable conditions and provisions of its MSS authorization.

US381--The frequencies 5332 kHz, 5348 kHz, 5368 kHz, 5373 kHz, and 5405 kHz are allocated to the amateur service on a secondary basis. Amateur use of these frequencies shall be limited to: (1) a maximum effective radiated power (e.r.p.) of 50 W; and, (2) single sideband suppressed carrier modulation (emission designator 2K8J3E), upper sideband voice transmissions only.

US382--In the band 39.5-40 GHz, Federal Government earth stations in the mobile-satellite service (space-to-Earth) shall not claim protection from non-Federal Government stations in the fixed and mobile services. ITU Radio Regulation No. **5.43A** does not apply.

US384--In the band 401-403 MHz, the non-Federal Government Earth exploration-satellite (Earth-to-space) and meteorological-satellite (Earth-to-space) services are limited to earth stations transmitting to Federal Government space stations.

US385--The band 1164-1215 MHz is also allocated to the radionavigation-satellite service (space-to-Earth, space-to-space) on a primary basis. In this band, stations in the radionavigation-satellite service shall not cause harmful interference to, nor claim protection from, stations of the aeronautical radionavigation service.

US386--In designing systems for the inter-satellite service in the band 32.3-33 GHz, for the radionavigation service in the band 32-33 GHz, and for the space research service (deep space) (space-to-Earth) in the band 31.8-32.3 GHz, all necessary measures shall be taken to prevent harmful interference between these services, bearing in mind the safety aspects of the radionavigation service.

US387--The band 75.5-76 GHz is also allocated to the amateur and amateur-satellite services on a secondary basis until January 1, 2006. After that date, the band 75.5-76 GHz shall no longer be available for use by the amateur service or the amateur-satellite service.

US388--In the bands 81-86 GHz, 92-94 GHz, and 94.1-95 GHz and within the coordination distances indicated below, assignments to allocated services shall be coordinated with the following radio astronomy observatories. New observatories shall not receive protection from fixed stations that are licensed to operate in the one hundred most populous urbanized areas as defined by the U.S. Census Bureau for the year 2000. The coordinates listed below are specified in terms of the North American Datum of 1983.

Note: Satisfactory completion of the coordination procedure utilizing the automated mechanism, see §101.1523, will be deemed to establish sufficient separation from radio astronomy observatories, regardless of whether the distances set forth above are met.

Telescope and site	**150 kilometer (93 mile) radius centered on:**	
	North Latitude	**West Longitude**
National Radio Astronomy Observatory (NRAO), Robert C. Byrd Telescope, Green Bank, WV	38° 25' 59''	79° 50' 24''
NRAO, Very Large Array, Socorro, NM	34° 04' 44''	107° 37' 06''
University of Arizona 12-m Telescope, Kitt Peak, AZ	31° 57' 10''	111° 36' 50''
BIMA Telescope, Hat Creek, CA	40° 49' 04''	121° 28' 24''
Caltech Telescope, Owens Valley, CA	37° 13' 54''	118° 17' 36''
Five Colleges Observatory, Amherst, MA	42° 23' 33''	72° 20' 40''
Haystack Observatory, Westford, MA	42° 37' 23''	71° 29' 19''
James Clerk Maxwell Telescope, Mauna Kea, HI	19° 49' 33''	155° 28' 20''
Combined Array for Research in Millimeter-wave Astronomy (CARMA), CA	CARMA will be located at a new, high-altitude site in eastern California, expected to be operational in 2004.	
NRAO, Very Long Baseline Array Stations	**25 kilometer (15.5 mile) radius centered on:**	
	North Latitude	**West Longitude**
Brewster, WA	48° 07' 52''	119° 41' 00''
Fort Davis, TX	30° 38' 06''	103° 56' 41''
Hancock, NH	42° 56' 01''	71° 59' 12''
Kitt Peak, AZ	31° 57' 23''	111° 36' 45''
Los Alamos, NM	35° 46' 31''	106° 14' 44''
Mauna Kea, HI	19° 48' 05''	155° 27' 19''
North Liberty, IA	41° 46' 17''	91° 34' 27''
Owens Valley, CA	37° 13' 54''	118° 16' 37''

Pie Town, NM	34° 18' 04''	108° 07' 09''
Saint Croix, VI	17° 45' 24''	64° 35' 01''

US389--In the bands 71-76 GHz and 81-86 GHz, stations in the fixed, mobile, and broadcasting services shall not cause harmful interference to, nor claim protection from, Federal Government stations in the fixed-satellite service at any of the following 28 military installations:

Military Installation	ST	Nearby city
Redstone Arsenal	AL	Huntsville
Fort Huachuca	AZ	Sierra Vista
Yuma Proving Ground	AZ	Yuma
Beale AFB	CA	Marysville
Camp Parks Reserve Forces Training Area	CA	Dublin
China Lake Naval Air Weapons Station	CA	Ridgecrest
Edwards AFB	CA	Rosamond
Fort Irwin	CA	Barstow
Marine Corps Air Ground Combat Center	CA	Twentynine Palms
Buckley AFB	CO	Aurora (Denver)
Schriever AFB	CO	Colorado Springs
Fort Gordon	GA	Augusta
Naval Satellite Operations Center	GU	Finegayan (Territory of Guam)
Naval Computer and Telecommunications Area Master Station, Pacific	HI	Wahiawa (Oahu Is.)
Fort Detrick	MD	Frederick
Nellis AFB	NV	Las Vegas
Nevada Test Site	NV	Amargsa Valley
Tonapah Test Range Airfield	NV	Tonopah
Cannon AFB	NM	Clovis
White Sands Missile Range	NM	White Samds
Dyess AFB	TX	Abilene
Fort Bliss	TX	El Paso
Fort Sam Houston	TX	San Antonio
Goodfellow AFB	TX	San Angelo
Kelly AFB	TX	San Antonio
Utah Test and Training Range	UT	.....
Fort Belvoir	VA	Alexandria
Naval Satellite Operations Center	VA	Chesapeake

US390--Federal Government stations in the space research service (active) operating in the band 5350-5460 MHz shall not cause harmful interference to, nor claim protection from, Federal and non-Federal Government stations in the aeronautical radionavigation service nor Federal Government stations in the radiolocation service.

NON-FEDERAL GOVERNMENT (NG) FOOTNOTES

(These footnotes, each consisting of the letters "NG" followed by one or more digits, denote stipulations applicable only to the non-Federal Government. These are FCC footnotes, in some cases a Part number will be referenced , this information is contained in CFR- 47)

NG2--Facsimile broadcasting stations may be authorized in the band 88-108 MHz.
NG3--Control stations in the domestic public mobile radio service may be authorized frequencies in the band 72-73 and 75.4-76 MHz on the condition that harmful interference will not be caused to operational fixed stations.
NG4--The use of the frequencies in the band 152.84-153.38 MHz may be authorized, in any area, to remote pickup broadcast base and mobile stations on the condition that harmful interference will not be caused to stations operating in accordance with the Table of Frequency Allocations.
NG6--Stations in the public safety radio services authorized as of June 30, 1958, to use frequencies in the band 159.51-161.79 MHz in areas other than Puerto Rico and the Virgin Islands may continue such operation, including expansion of existing systems, on the condition that harmful interference will not be caused to stations in the services to which these bands are allocated. In Puerto Rico and the Virgin Islands this authority is limited to frequencies in the band 160.05-161.37 MHz. No new public radio service system will be authorized to operate on these frequencies.
NG12--Frequencies in the bands 454.40-455 MHz and 459.40-460 MHz may be assigned to domestic public land and mobile stations to provide a two-way air-ground public radio-telephone service.
NG17--Stations in the land transportation radio services authorized as of May 15, 1958 to operate on the frequency 161.61 MHz may, upon proper application, continue to be authorized for such operation, including expansion of existing systems, on the condition that harmful interference will not be caused to the operation of any authorized station in the maritime mobile service. No new land transportation radio service system will be authorized to operate on 161.61 MHz.
NG19--Fixed stations associated with the maritime mobile service may be authorized, for purposes of communication with coast stations, to use frequencies assignable to ship stations in this band on the condition that harmful interference will not be caused to services operating in accordance with the Table of Frequency Allocations.
NG28--The frequency band 160.86-161.40 MHz is available for assignment to remote pickup base and remote pickup mobile stations in Puerto Rico and the Virgin Islands only on a shared basis with the land transportation radio service.
NG31--Stations in the Rural Radio Service licensed for Basic Exchange Telecommunications Radio Service may be authorized to use some frequencies in the bands 816-820 MHz (fixed subscriber) and 861-865 MHz (central office or base), on a co-primary basis with private land mobile radio licensees, pursuant to part 22 subpart H.
NG41--Frequencies in the bands 3700-4200 MHz and 5925-6425 MHz, may also be assigned to stations in the international fixed public and international control services located in Puerto Rico, the U.S. Virgin Islands, and Navassa Island.
NG42--Non-Government stations in the radiolocation service shall not cause harmful interference to the amateur service.
NG49--The following frequencies may be authorized for mobile operations in the Manufacturers Radio Service subject to the condition that no interference is caused to the reception of television stations oper-

ating on channels 4 and 5 and that their use is limited to a manufacturing facility:

MHz				
72.02	72.10	72.18	72.26	72.34
72.04	72.12	72.20	72.28	72.36
72.06	72.14	72.22	72.30	72.38
72.08	72.16	72.24	72.32	72.40

Further, the following frequencies may be authorized for mobile operations in the Special Industrial Radio Service, Manufacturers Radio Service, Railroad Radio Service and Forest Products Radio Service subject to the condition that no interference is caused to the reception of television stations operating on channels 4 and 5; and that their use is limited to a railroad yard, manufacturing plant, logging site, mill, or similar industrial facility.

MHz				
72.44	72.52	72.60	75.48	75.56
72.48	72.56	75.44	75.52	75.60

NG51--In Puerto Rico and the Virgin Islands only, the bands 150.8-150.98 MHz and 150.98-151.49 MHz are allocated exclusively to the business radio service.

NG53--The band 13.15-13.20 GHz is reserved for television pickup and CARS pickup stations inside a 50 km radius of the 100 television markets delineated in Section 76.51. Outside a 50 km radius of the 100 television markets delineated in Section 76.51, television pickup stations, CARS stations and NGSO FSS gateway earth stations shall operate on a primary co-equal basis. The band 13.20-13.2125 GHz is reserved for television pickup stations on a primary basis and CARS pickup stations on a secondary basis inside a 50 km radius of the 100 television markets delineated in Section 76.51. Outside a 50 km radius of the 100 markets delineated in Section 76.51, television pickup stations and NGSO FSS gateway earth stations shall operate on a co-primary basis, CARS stations shall operate on a secondary basis. Fixed television auxiliary stations licensed pursuant to applications accepted for filing before September 1, 1979, may continue operation on channels in the 13.15-13.25 GHz band, subject to periodic license renewals. NGSO FSS gateway uplink transmissions in the 13.15-13.2125 GHz segment shall be limited to a maximum EIRP of 3.2 dBW towards 0 degrees on the radio horizon. The above provisions shall not apply to GSO FSS operations in the 12.75-13.25 GHz band.

NG56--In the bands 72.0-73.0 and 75.4-76.0 MHz, the use of mobile radio remote control of models is on a secondary basis to all other fixed and mobile operations. Such operations are subject to the condition that interference will not be caused to common carrier domestic public stations, to remote control of industrial equipment operating in the 72-76 MHz band, or to the reception of television signal on channels 4 (66-72 MHz) or 5 (76-82 MHz). Television interference shall be considered to occur whenever reception of regularly used television signals is impaired or destroyed, regardless of the strength of the television signal or the distance to the television station.

NG59--The frequencies 37.60 and 37.85 MHz may be authorized only for use by base, mobile, and operational fixed stations participating in an interconnected or coordinated power service utility system.

NG66 The band 470-512 MHz (TV channels 14-20) is allocated to the broadcasting service on an exclusive basis throughout the United States and its insular areas, except as described below:

(a) In the urbanized areas listed in the table below, the indicated frequency bands are allocated to the land mobile service on an exclusive basis for assignment to eligibles in the Public Mobile Services, the Public Safety Radio Pool, and the Industrial/Business Radio Pool, except that:

(1) Licensees in the land mobile service that are regulated as Commercial Mobile Radio Service (CMRS) providers may also use their assigned spectrum to provide fixed service on a primary basis.

(2) The use of the band 482-488 MHz (TV channel 16) is limited to eligibles in the Public Safety

Radio Pool in or near (i) the Los Angeles urbanized area; and (ii) New York City; Nassau, Suffolk, and Westchester Counties in New York State; and Bergen County, New Jersey.

Urbanized area	Bands (MHz)	TV channels
Boston, MA	470-476, 482-488	14, 16
Chicago, IL-Northwestern Indiana	470-476, 476-482	14, 15
Cleveland, OH	470-476, 476-482	14, 15
Dallas-Fort Worth, TX	482-488	16
Detroit, MI	476-482, 482-488	15, 16
Houston, TX	488-494	17
Los Angeles, CA	470-476, 482-488, 506-512	14, 16, 20
Miami, FL	470-476	14
New York, NY-Northeastern New Jersey	470-476, 476-482, 482-488	14, 15, 16
Philadelphia, PA-New Jersey	500-506, 506-512	19, 20
Pittsburgh, PA	470-476, 494-500	14, 18
San Francisco-Oakland, CA	482-488, 488-494	16, 17
Washington, D.C.-Maryland-Virginia	488-494, 494-500	17, 18

(b) In the Gulf of Mexico offshore from the Louisiana-Texas coast, the band 476-494 MHz (TV channels 15-17) is allocated to the fixed and mobile services on a primary basis for assignment to eligibles in the Public Mobile and Private Land Mobile Radio Services.

(c) In Hawaii, the band 488-494 MHz (TV channel 17) is allocated exclusively to the fixed service for use by common carrier control and repeater stations for point-to-point inter-island communications only.

(d) The use of these allocations is further subject to the conditions set forth in 47 C.F.R. parts 22 and 90.

NG70--In Puerto Rico and the Virgin Islands only, the bands 159.240-159.435 and 160.410-160.620 MHz are also available for assignment to base stations and mobile stations in the special industrial radio service.

NG104--The use of the bands 10.7-11.7 GHz (space-to-Earth) and 12.75-13.25 GHz (Earth-to-space) by the fixed-satellite service in the geostationary-satellite orbit shall be limited to international systems, *i.e.*, other than domestic systems.

NG111--The band 157.4375-157.4625 MHz may be used for one way paging operations in the special emergency radio service.

NG112--The frequencies 25.04, 25.08, 150.980, 154.585, 158.445, 159.480, 454.000 and 459.000 MHz may be authorized to stations in the petroleum radio service for use primarily in oil spill containment and cleanup operations and secondarily in regular land mobile communication.

NG115--In the bands 54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz, and 614-806 MHz, wireless microphones and wireless assist video devices may be authorized on a non-interference basis, subject to the terms and conditions set forth in 47 C.F.R. part 74, subpart H.

NG117--The frequency 156.050 and 156.175 MHz may be assigned to stations in the maritime mobile service for commercial and port operations in the New Orleans Vessel Traffic Service (VTS) area and the frequency 156.250 MHz may be assigned to stations in the maritime mobile service for port operating in

the New Orleans and Houston VTS areas.

NG118--In the bands 2025-2110 MHz, 6875-7125 MHz, and 12.7-13.25 GHz, television translator relay stations may be authorized to use frequencies on a secondary basis to other stations in the Television Broadcast Auxiliary Service that are operating in accordance with the Table of Frequency Allocations.

NG120--Frequencies in the band 928-960 MHz may be assigned for multiple address systems and mobile operations on a primary basis as specified in 47 C.F.R. part 101.

NG124--Within designated segments of the bands that comprise 30.85-47.41 MHz, 150.8-159.465 MHz, and 453.0125-467.9875 MHz, police licensees are authorized to operate low power radio transmitters on a secondary, non-interference basis in accordance with the provisions of 47 C.F.R. §§ 2.803 and 90.20(e)(5).

NG128--In the band 535-1705 kHz, AM broadcast licensees or permittees may use their AM carrier on a secondary basis to transmit signals intended for both broadcast and non-broadcast purposes. In the band 88-108 MHz, FM broadcast licensees or permittees are permitted to use subcarriers on a secondary basis to transmit signals intended for both broadcast and non-broadcast purposes. In the bands 54-72, 76-88, 174-216, 470-608 and 614-806 MHz, TV broadcast licensees or permittees are permitted to use subcarriers on a secondary basis for both broadcast and non-broadcast purposes.

NG134--In the band 10.45-10.5 GHz non-Government stations in the radiolocation service shall not cause harmful interference to the amateur and amateur-satellite services.

NG135--In the 420-430 MHz band the amateur service is not allocated north of line A (def. § 2.1).

NG141--The frequencies 42.40 MHz and 44.10 MHz are authorized on a primary basis in the State of Alaska for meteor burst communications by fixed stations in the Rural Radio Service operating under the provisions of part 22 of this chapter. The frequencies 44.20 MHz and 45.90 MHz are authorized on a primary basis in Alaska for meteor burst communications by fixed private radio stations operating under the provisions of part 90 of the chapter. The private radio station frequencies may be used by Common Carrier stations on a secondary, noninterference basis and the Common Carrier frequencies may be used by private radio stations for meteor burst communications on a secondary, noninterference basis. Users shall cooperate to the extent practical to minimize potential interference. Stations utilizing meteor burst communications shall not cause harmful interference to stations of other radio services operating in accordance with the Table of Frequency Allocations.

NG142--TV broadcast stations authorized to operate in the bands 54-72, 76-88, 174-216, 470-512, and 512-806 MHz may use a portion of the television vertical blanking interval for the transmission of telecommunications signals, on the condition that harmful interference will not be caused to the reception of primary services, and that such telecommunications services must accept any interference caused by primary services operating in these bands.

NG143--In the band 11.7-12.2 GHz, protection from harmful interference shall be afforded to transmissions from space stations not in conformance with ITU Radio Regulation **5.488** only if the operations of such space stations impose no unacceptable constraints on operations or orbit locations of space stations in conformance with **5.488**.

NG144--Stations authorized as of September 9, 1983 to use frequencies in the bands 17.7-18.58 GHz and 19.3-19.7 GHz may, upon proper application, continue operations. Fixed stations authorized in the band 18.58-19.3 GHz that remain co-primary under the provisions of §§ 21.901(e), 74.502(c), 74.602(g), 78.18(a)(4), and 101.174(r) may continue operations consistent with the provisions of those sections.

NG145--In the band 11.7-12.2 GHz, transponders on space stations in the fixed-satellite service may be used additionally for transmissions in the broadcasting-satellite service, provided that such transmissions do not have a maximum e.i.r.p. greater than 53 dBW per television channel and do not cause greater interference or require more protection from interference than the coordinated fixed-satellite service frequency assignments. With respect to the space services, this band shall be used principally for the fixed-satellite service.

NG147--Stations in the broadcast auxiliary service and private radio services licensed as of July 25, 1985,

or on a subsequent date following as a result of submitting an application for license on or before July 25, 1985, may continue to operate on a primary basis with the mobile-satellite service and the radiodetermination satellite service.

NG148--The frequencies 154.585 MHz, 159.480 MHz, 160.725 MHz, 160.785 MHz, 454.000 MHz and 459.000 MHz may be authorized to maritime mobile stations for offshore radio-location and associated telecommand operations.

NG149--The frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz, 470-512 MHz, 512-608 MHz, and 614-698 MHz are also allocated to the fixed service to permit subscription television operations in accordance with Part 73 of the rules.

NG152--The band 219-220 MHz is also allocated to the amateur service on a secondary basis for stations participating, as forwarding stations, in point-to-point fixed digital message forwarding systems, including intercity packet backbone networks.

NG153--The band 2160-2165 MHz is reserved for future emerging technologies on a co-primary basis with the fixed and mobile services. Allocations to specific services will be made in future proceedings. Authorizations in the band 2160-2162 MHz for stations in the Multipoint Distribution Service applied for after January 16, 1992 shall be on a secondary basis to emerging technologies.

NG155--The bands 159.500-159.675 MHz and 161.375-161.550 MHz are allocated to the maritime service as described in Part 80 of this chapter. Additionally, the frequencies 159.550, 159.575 and 159.600 MHz are available for low-power intership communications.

NG156--The band 2000-2020 MHz is also allocated to the fixed and mobile services on a primary basis for facilities where the receipt date of the initial application was prior to June 27, 2000, and on a secondary basis for all other initial applications. Not later than December 9, 2013, the band 2000-2020MHz is allocated to the fixed and mobile services on a secondary basis.

NG158--The frequency bands 764-776 MHz and 794-806 MHz are available for assignment exclusively to the public safety services, to be defined in Docket No. WT 96–86.

NG159--Full power analog television stations licensed and new digital television (DTV) broadcasting operations in the band 698-806 MHz shall be entitled to protection from harmful interference until the end of the DTV transition period. Low power television and television translators in the band 746-806 MHz must cease operations in the band at the end of the DTV transition period. Low power television and television translators in the band 698-746 MHz are secondary to all other operations in the band 698-746 MHz.

NG160--In the 5850-5925 MHz band, the use of the non-Federal government mobile service is limited to Dedicated Short Range Communications operating in the Intelligent Transportation System radio service.

NG163--The allocation to the broadcasting-satellite service in the band 17.3-17.7 GHz shall come into effect on 1 April 2007.

NG164--The use of the band 18.3-18.8 GHz by the fixed-satellite service (space-to-Earth) is limited to systems in the geostationary-satellite orbit.

NG165--The use of the band 18.8-19.3 GHz by the fixed-satellite service (space-to-Earth) is limited to systems in non-geostationary-satellite orbits.

NG166--The use of the band 19.3-19.7 GHz by the fixed-satellite service (space-to-Earth) is limited to feeder links for the mobile-satellite service.

NG167--The use of the fixed-satellite service (Earth-to-space) in the band 24.75-25.25 GHz is limited to feeder links for the broadcasting-satellite service operating in the band 17.3-17.7 GHz. The allocation to the fixed-satellite service (Earth-to-space) in the band 24.75-25.25 shall come into effect on 1 April 2007.

NG168--The band 2180-2200 MHz is also allocated to the fixed and mobile services on a primary basis for facilities where the receipt date of the initial application was prior to January 16, 1992, and on a secondary basis for all other initial applications. Not later than December 9, 2013, the band 2180-2200 MHz is allocated to the fixed and mobile services on a secondary basis.

NG169--After December 1, 2000, operations on a primary basis by the fixed-satellite service (space-to-

Earth) in the band 3650-3700 MHz shall be limited to grandfathered earth stations. All other fixed-satellite service earth station operations in the band 3650-3700 MHz shall be on a secondary basis. Grandfathered earth stations are those authorized prior to December 1, 2000, or granted as a result of an application filed prior to December 1, 2000, and constructed within 12 months of initial authorization. license applications for primary operations for new earth stations, major amendments to pending earth station applications, or applications for major modifications to earth station facilities filed on or after December 18, 1998, and prior to December 1, 2000, shall not be accepted unless the proposed facilities are in the vicinity (*i.e.* within 10 miles) of an authorized primary earth station operating in the band 3650-3700 MHz. License applications for primary operations by new earth stations, major amendments to pending earth station applications, and applications for major modifications to earth station facilities, filed after December 1, 2000, shall not be accepted, except for changes in polarization, antenna orientation or ownership of a grandfathered earth station.

NG170--In the band 3650-3700 MHz, the mobile except aeronautical mobile service is limited to base station operations. These base stations are subject to the same coordination procedures as fixed service operations in the band 3650-3700 MHz.

NG171--In the band 6875-7125 MHz, the following two channels should be used for airborne TV pickup stations, wherever possible: 7075-7100 MHz and 7100-7125 MHz.

NG172--In the band 7025-7075 MHz, the fixed-satellite service (space-to-Earth) is allocated on a primary basis, but the use of this allocation shall be limited to two grandfathered satellite systems. Associated earth stations located within 300 meters of the following locations shall be grandfathered: (1) in the band 7025-7075 MHz, Brewster, Washington (48°08'46.7"N, 119°42'8.0"W); and, (2) in the band 7025-7055 MHz, Clifton, Texas (31º47'58.5"N, 97º36'46.7"W) and Finca Pascual, Puerto Rico (17º58'41.8"N, 67º 8'12.6"W). All coordinates are specified in terms of the North American Datum of 1983.

NG173--In the band 216-220 MHz, secondary telemetry operations are permitted subject to the requirements of 47 C.F.R. § 90.259. After January 1, 2002, no new assignments shall be authorized in the band 216-217 MHz.

NG174--In Puerto Rico, frequencies within the band 2385-2390 MHz are not available for assignment to stations in the aeronautical mobile service.

NG175--Television pickup stations in the mobile services authorized to use frequencies in the band 38.6-40.0 GHz on or before April 16, 2003, may continue to operate on a secondary basis to stations operating in accordance with the Table of Frequency Allocations.

NG177--In the bands 1990-2000 MHz and 2020-2025 MHz, where the receipt date of the initial application for facilities in the fixed and mobile services was prior to June 27, 2000, said facilities shall operate on a primary basis and all later-applied-for facilities shall operate on a secondary basis to any service licensed pursuant to the allocation adopted in FCC 03-16, 68 FR 11986, March 13, 2003 ("Advanced Wireless Services"). Not later than December 9, 2013, all such facilities in the bands 1990-2000 MHz and 2020-2025 MHz shall operate on a secondary basis to Advanced Wireless Services.

NG178--In the band 2165-2180 MHz, where the receipt date of the initial application for facilities in the fixed and mobile services was prior to January 16, 1992, said facilities shall operate on a primary basis and all later-applied-for facilities shall operate on a secondary basis to any service licensed pursuant to the allocation adopted in FCC 03-16, 68 FR 11986, March 13, 2003 ("Advanced Wireless Services"). Not later than December 9, 2013, all such facilities in the band 2165-2180 MHz shall operate on a secondary basis to Advanced Wireless Services.

FEDERAL GOVERNMENT (G) FOOTNOTES

(These footnotes, each consisting of the letter "G" followed by one or more digits, denote stipulations applicable only to the Federal Government.)

G2[9]**--**In the bands 216-225 MHz, 420-450 MHz (except as provided by US217 and G129), 890-902 MHz, 928-942 MHz, 1300-1400 MHz, 2310-2385 MHz, 2417-2450 MHz, 2700-2900 MHz, 5650-5925 MHz, and 9000-9200 MHz, Federal Government use of the radiolocation service is limited to the military services.

G5[10]**--**In the bands 162.0125-173.2, 173.4-174, 406.1-410 and 410-420 MHz, use by the military services is limited by the provisions specified in the channeling plans shown in Sections 4.3.7 and 4.3.9 of the NTIA Manual.

G6--Military tactical fixed and mobile operations may be conducted nationally on a secondary basis: (1) To the meteorological aids service in the band 403-406 MHz; and (2) to the radio astronomy service in the band 406.1-410 MHz. Such fixed and mobile operations are subject to local coordination to ensure that harmful interference will not be caused to the services to which the bands are allocated.

G8--Low power Government radio control operations are permitted in the band 420-450 MHz.

G11--Government fixed and mobile radio services, including low power radio control operations, are permitted in the band 902-928 MHz on a secondary basis.

G15--Use of the band 2700-2900 MHz by the military fixed and shipborne air defense radiolocation installations will be fully coordinated with the meteorological aids and aeronautical radionavigation services. The military air defense installations will be moved from the band 2700-2900 MHz at the earliest practicable date. Until such time as military air defense installations can be accommodated satisfactorily elsewhere in the spectrum, such operations will, insofar as practicable, be adjusted to meet the requirements of the aeronautical radionavigation service.

G19--Use of the band 9000-9200 MHz by military fixed and shipborne air defense radiolocation installations will be fully coordinated with the aeronautical radionavigation service, recognizing fully the safety aspects of the latter. Military air defense installations will be accommodated ultimately out-side this band. Until such time as military defense installations can be accommodated satisfactorily elsewhere in the spectrum such operations will, insofar as practicable, be adjusted to meet the requirements of the aeronautical radionavigation services.

G27--In the bands 255-328.6 MHz, 335.4-399.9 MHz, and 1350-1390 MHz, the fixed and mobile services are limited to the military services.

G30--In the bands 138-144 MHz, 148-149.9 MHz, and 150.05-150.8 MHz, the fixed and mobile services are limited primarily to operations by the military services.

G31--In the band 3300-3500 MHz, the Government radiolocation is limited to the military services, except as provided by footnote US108.

G32--Except for weather radars on meteorological satellites in the band 9975-10025 MHz and for Government survey operations (see footnote US108), Government radiolocation in the band 10000-10500 MHz is limited to the military services.

G34--In the band 34.4-34.5 GHz, weather radars on board meteorological satellites for cloud detection are authorized to operate on the basis of equality with military radio-location devices. All other non-military radiolocation in the band 33.4-36.0 GHz shall be secondary to the military services.

G42--Space command, control, range and range rate systems for earth station transmission only (including installations on certain Navy ships) may be accommodated on a co-equal basis with the fixed and mobile services in the band 1761-1842 MHz. Specific frequencies required to be used at any location will be satisfied on a coordinated case-by-case basis.

G56--Government radiolocation in the bands 1215-1300, 2900-3100, 5350-5650 and 9300-9500 MHz is primarily for the military services; however, limited secondary use is permitted by other Government

9. The Medical Telemetry Report and Order (FCC 00-31, released June 12, 2000) reallocated the band 1395-1400 MHz. Government medical telemetry use is allowed in this band. See footnote US351 for grandfathered government sites.

10. The text of this footnote differs from the text contained in the FCC regulation.

agencies in sup-port of experimentation and research pro-grams. In addition, limited secondary use is permitted for survey operations in the band 2900-3100 MHz.

G59--In the bands 902-928 MHz, 3100-3300 MHz, 3500-3650 MHz, 5250-5350 MHz, 8500-9000 MHz, 9200-9300 MHz, 13.4-14.0 GHz, 15.7-17.7 GHz and 24.05-24.25 GHz, all Government non-military radiolocation shall be secondary to military radiolocation, except in the sub-band 15.7-16.2 GHz airport surface detection equipment (ASDE) is permitted on a co-equal basis subject to coordination with the military departments.

G100--The bands 235-322 MHz and 335.4-399.9 MHz are also allocated on a primary basis to the mobile-satellite service, limited to military operations.

G104--In the bands 7450-7550 and 8175-8215 MHz, it is agreed that although the military space radio communication systems, which include earth stations near the proposed meteorological-satellite installations will precede the meteorological-satellite installations, engineering adjustments to either the military or the meteorological-satellite systems or both will be made as mutually required to assure compatible operations of the systems concerned.

G106--The bands 2501-2502 kHz, 5003-5005 kHz, 10003-10005 kHz, 15005-15010 kHz, 19990-19995 kHz, 20005-20010 kHz and 25005-25010 kHz are also allocated, on a secondary basis, to the space research service. The space research transmissions are subject to immediate temporary or permanent shutdown in the event of interference to the reception of the standard frequency and time broadcasts.

G109--All assignments in the band 157.0375-157.1875 MHz are subject to adjustment to other frequencies in this band as long term U.S. maritime VHF planning develops, particularly that planning incident to support of the National VHF-FM Radiotelephone Safety and Distress System (See Doc. 15624/1-1.9.111/1.9.125).

G110--Government ground-based stations in the aeronautical radionavigation service may be authorized between 3500-3650 MHz when accommodation in the band 2700-2900 MHz is not technically and/or economically feasible.

G114--The band 1369.05-1390 MHz is also allocated to the fixed-satellite service (space-to-Earth) and to the mobile-satellite service (space-to-Earth) on a primary basis for the relay of nuclear burst data.

G115--In the band 13360-13410 kHz, the fixed service is allocated on a primary basis out-side the conterminous United States. Within the conterminous United States, assignments in the fixed service are permitted, and will be protected for national defense purposes or, if they are to be used only in an emergency jeopardizing life, public safety, or important property under conditions calling for immediate communication where other means of communication do not exist.

G116--The band 7125-7155 MHz is also allocated for Earth-to-space transmissions in the Space Operations Service at a limited number of sites (not to exceed two), subject to established coordination procedures.

G117--In the bands 7.25-7.75 GHz, 7.9-8.4 GHz, 17.8-21.2 GHz, 30-31 GHz, 33-36 GHz, 39.5-40.5 GHz, 43.5-45.5 GHz, and 50.4-51.4 GHz, the Government fixed-satellite and mobile-satellite services are limited to military systems.

G118--Government fixed stations may be authorized in the band 1700-1710 MHz only if spectrum is not available in the band 1710-1850 MHz.

G120--Development of airborne primary radars in the band 2310-2385 MHz with peak transmitter power in excess of 250 watts for use in the United States is not permitted.

G122--In the bands 2390-2400 MHz, 2402-2417 MHz, and 4940-4990 MHz, Government operations may be authorized on a non-interference basis to authorized non-Government operations, but shall not hinder the implementation of any non-Government operations.

G123--The bands 2300-2310 and 2400-2402 MHz were identified for reallocation, effective August 10, 1995, for exclusive non-Government use under Title VI of the Omnibus Budget Reconciliation Act of 1993. Effective August 10, 1995, any Government operations in these bands are on a non-interference basis to authorized non-Government operations and shall not hinder the implementation of any non-Gov-

ernment operations.

G124--The band 2417-2450 MHz was identified for reallocation, effective August 10, 1995, for mixed Government and non-Government use under Title VI of the Omnibus Budget Reconciliation Act of 1993.

G127--In Hawaii, the frequency band 488-494 MHz is allocated exclusively to the fixed service for use by common carrier control and repeater stations for point-to-point inter-island communications only.

G128--Use of the band 56.9-57 GHz by inter-satellite systems is limited to transmissions between satellites in geostationary orbit, to transmissions between satellites in geostationary satellite orbit and those in high-Earth orbit, to transmissions from satellites in geostationary satellite orbit to those in low-Earth orbit, and to transmissions from non-geostationary satellites in high-Earth orbit to those in low-Earth orbit. For links between satellites in the geostationary satellite orbit, the single entry power flux-density at all altitudes from 0 km to 1000 km above the Earth's surface, for all conditions and for all methods of modulation, shall not exceed -147 dB ($W/m^2/100$ MHz) for all angles of arrival.

G129--Federal Government wind profilers are authorized to operate on a primary basis in the radiolocation service in the frequency band 448-450 MHz with an authorized bandwidth of no more than 2 MHz centered on 449 MHz, subject to the following conditions: 1) wind profiler locations must be pre-coordinated with the military services to protect fixed military radars; and 2) wind profiler operations shall not cause harmful interference to, nor claim protection from, military mobile radiolocation stations that are engaged in critical national defense operations.

G130--Federal Government stations in the radiolocation service operating in the band 5350-5470 MHz, shall not cause harmful interference to, nor claim protection from, Federal stations in the aeronautical radionavigation service operating in accordance with ITU *Radio Regulation* No. **5.449**.

G131--Federal Government stations in the radiolocation service operating in the band 5470-5650 MHz, with the exception of ground-based radars used for meteorological purposes operating in the band 5600-5650 MHz, shall nor cause harmful interference to, nor claim protection from, Federal Government stations in the maritime radionavigation service.

G132--Use of the radionavigation-satellite service in the band 1215-1240 MHz shall be subject to the condition that no harmful interference is caused to, and no protection is claimed from, the radionavigation service authorized under No. 5.331. Furthermore, the use of the radionavigation-satellite service in the band 1215-1240 MHz shall be subject to the condition that no harmful interference is caused to the radiolocation service. ITU Radio Regulation No. 5.43 shall not apply in respect of the radiolocation service. ITU Resolution **608 (WRC-03)** shall apply.

G133--No emissions to deep space shall be effected in the band 7190-7235 MHz. Geostationary satellites in the space research service operating in the band 7190-7235 MHz shall not claim protection from existing and future stations of the fixed and mobile services and No. **5.43A** does not apply.

G134--In the band 14.8-15.35 GHz, earth stations operating in the space research service shall not claim protection from stations in the fixed and mobile services operated by other administrations.

4.2 FREQUENCY ALLOTMENTS

4.2.1 Allotment of 27575 and 27585 kHz for Short-Distance Low-Power Service

These allotments are to provide for intermittent miscellaneous U.S. Government short-distance low-power radio communications, radio signaling, and the control of remote objects or devices by means of radio (where the radiated power exceeds the limit established under Part 7.9).

The designated frequencies are allotted for use by U.S. Government agencies and may be authorized for use by agencies as required upon application. All stations operating on these frequencies shall meet the conditions and standards established for this service.

The designated frequencies are available on a shared basis only and will not be authorized for exclusive use of any one agency. No protection from interference can be assured to any station operating in this

service. Services involving safety of life and property should not employ these frequencies in view of their unprotected status. All transmissions are to be restricted to official U. S. Government business that requires the use of radio.

Stations in this service shall utilize FCC type-accepted or type-approved Citizens Radio Band equipment or the equivalent. The maximum transmitter output power shall be five watts.

Stations shall be identified in accordance with the regulations of each agency.

The only class of station authorized is Mobile (including portable-type operation).

Frequencies 27575 and 27585 kHz with 6KA2A, 6KA2D and 6KA3E emission are designated for the U.S. Government short-distance low-power radio service.

All applications for the use of these frequencies must bear the note S159 which reads, "U.S. Government short-distance low-power service."

4.2.2 Allotments in the Band 1710-1850 MHz for Fixed Security Surveillance Systems

The frequencies 1720, 1740, 1760, 1780, and 1800 MHz are allotted for use in fixed security surveillance systems, on a secondary basis to other stations operating in accordance with the Government Table of Frequency allocations.

4.2.3 Allotment of 163.100, 418.050, and 418.575 MHz for Wide Area Use

(Assignments made under these procedures shall no longer be authorized after December 31, 2004.)

1. The frequencies 163.100, 418.050, and 418.575 MHz are allotted for use by all U.S. Government agencies and are to satisfy intermittent wide area requirements of a transient nature. Coordination in accordance with Section 8.3.18 is not required.

2. All operations shall be authorized in accordance with Chapter 9 of the Manual. The frequencies are available on a shared non-priority basis only, and will not be authorized nor are they intended for the exclusive use of any one agency. No protection from interference will be provided to any station operating on these frequencies from other stations operating on the same frequency. The use of equipment with coded squelch is strongly encouraged to reduce nuisance interference from other users.

3. The intent of these allotments is for use by Government stations in the Land or Maritime Mobile Services, which are unlikely to cause harmful interference to other stations operating in these Services, (Table of Services, Station Classes, and Stations, Section 6.1.4 refers) and the following restrictions apply:

(a) the minimum ERP necessary to support the intended use shall be employed;

(b) the maximum base or mobile station transmitter output power shall not exceed 30 Watts;

(c) the gain of the base station antenna shall not exceed 6 dBi;

(d) the height of the base station antenna shall not exceed 6 meters above the height of the structure supporting the antenna;

(e) station classes are limited to FB, FC, ML, MLP, MS, MSP. However, these station classes may be suffixed with the letter "R" as applicable and restricted by 3. (e)(1) below.

(1) Mobile and/or transportable repeater transmitting stations (as defined in Sections 6.1.2, Paragraph 3 and 9.8.2, Paragraph 15c) may be authorized only on 163.1 or 418.05 MHz but are restricted to a maximum placement period of 45 days and a maximum transmitter output power of 30 Watts. (For transportable repeater stations, Note S362 applies.) The repeater receive frequencies are 168.35 or 408.4 MHz.

(f) stations in the Fixed Service (FX station class) may be authorized but are restricted to transportable stations (Note S362 applies).

(g) All equipment shall conform to Part 5.3 of the Manual.

4. All applications utilizing these allotted frequencies must be affixed with Record Note S352 "This assignment is for intermittent wide area requirements of transient, itinerant nature pursuant to Section 4.2.3 of the Manual."

4.2.4 Allotment of 168.350, 408.400, and 418.075 MHz for Common Use Frequencies

(Assignments made under these procedures shall no longer be authorized after December 31, 2004.)

1. The frequencies 168.350, 408.400, and 418.075 MHz are allotted for use by all U.S. Government agencies and are to provide for radio communications that do not justify the assigning of a radio frequency exclusively to that use, i.e., the frequency can be shared with other users. Coordination in accordance with Section 8.3.18 is not required.

2. All operations shall be authorized in accordance with Chapter 9 of the Manual. The frequencies are available on a shared non-priority basis only, and will not be authorized nor are they intended for the exclusive use of any one agency. No protection from interference will be provided to any station operating on these frequencies from other stations operating on the same frequency. The use of equipment with coded squelch is strongly encouraged to reduce nuisance interference from other users.

3. The intent of these allotments is for use by Government stations in the Land or Maritime Mobile Services, which are unlikely to cause harmful interference to other stations operating in these Services (Table of Services, Station Classes, and Stations, Section 6.1.4 refers) and the following restrictions apply:

(a) the minimum ERP necessary to support the intended use shall be employed;

(b) the maximum base or mobile station transmitter output power shall not exceed 30 Watts;

(c) the gain of the base station antenna shall not exceed 6 dBi;

(d) the height of the base station antenna shall not exceed 6 meters above the height of the structure supporting the antenna;

(e) station classes are limited to FB, FC, ML, MLP, MS, MSP.

(f) stations in the Fixed Service (FX station class) may be authorized but are restricted to transportable stations (Note S362 applies).

(g) all equipment shall conform to Part 5.3 of the Manual.

4. All applications utilizing these allotted frequencies must be affixed with record note S353 "This assignment is for a common use frequency pursuant to Section 4.2.4 of the Manual."

4.2.5 Allotments for Wide-Area, Common-Use Frequencies

(These allotments and procedures may be used for new assignments subject to not causing interference to assignments existing prior to May 1, 1998, on the frequencies listed herein except 163.1 MHz, 168.35 MHz and 418.05 MHz. Effective January 1, 2005, these allotments and procedures may be used for new assignments without restrictions. Assignments authorized on the frequencies listed herein prior to January 1, 2005, that are not in accordance with these procedures shall no longer be authorized after that date.)

1. Wide-Area, Common-Use frequencies are allotted for use by all U.S. Government agencies and are to provide for radio communications that do not justify the assigning of a radio frequency exclusively to that use, i.e., the frequency can be shared with other users. Coordination in accordance with Section 8.3.18 of this Manual is not required.

a. The following paired frequencies are to be used for wide-area (e.g., county-wide, state-wide, USA or USP) operations of a transient nature that require the use of a repeater station. Unpaired, single frequency operations will be permitted on the repeater transmit frequencies and on the repeater receive frequencies only if all other wide-area, common-use frequencies are in use, but only upon showing that

none of the unpaired frequencies in subparagraph b., below, are available.

Frequencies (MHz)	
Repeater Transmit	Repeater Receive
163.1	168.35
409.05	418.05
409.3375	418.3375

The frequencies 409.05 and 409.3375 MHz shall not be used in the U.S./Canada Border Areas unless prior coordination has been effected with Canada under the provisions of paragraphs 3.9 and 3.10 of Section 3.4.7 of this Manual, or the output power is 5 watts or less and interference does not occur to Canadian operations.

b. The following frequencies are to be used only for wide-area (e.g., county-wide, state-wide, USA or USP) operations of a transient nature that do not require the use of a repeater station, and shall be used in a simplex mode (use of a base station is allowed):

Frequencies (MHz)	
412.825	412.8375
412.85	412.8625

2. All operations shall be authorized in accordance with Chapter 9 of this Manual. The frequencies are available on a shared, non-priority basis only, and will not be authorized for, nor are they intended for, the exclusive use of any one agency. No protection from interference will be provided to any station operating on these frequencies from other stations operating on the same frequency. The use of equipment with coded squelch is strongly encouraged to reduce nuisance interference from other users.

3. These allotments are for use by Government stations in the Land and Maritime Mobile Services (Table of Services, Station Classes, and Stations, Chapter 6, Section 6.1.4 of this Manual refers), and the following restrictions apply.

a. the minimum ERP necessary to support the intended use shall be employed;

b. the maximum base or mobile station transmitter output power shall not exceed 30 watts;

c. the gain of the base station (or repeater station) antenna shall not exceed 6 dBi;

d. the height of the base station (or repeater station) antenna shall not exceed 6 meters above the height of the structure supporting the antenna;

e. all equipment shall conform to Part 5.3 of this Manual;

4. Applications for assignments on the frequencies listed in subparagraphs 1.a. and 1.b., above, shall be affixed with Record Note S355, "This assignment is for a wide-area, common-use frequency pursuant to Section 4.2.5 of the NTIA Manual."

4.2.6 Allotments for Local-Area, Common-Use Frequencies

(These allotments and procedures may be used for new assignments subject to not causing interference to assignments existing prior to May 1, 1998, on the frequencies listed herein. Effective January 1, 2005, these allotments and procedures may be used for new assignments without restrictions. Assignments authorized on the frequencies listed herein prior to January 1, 2005, that are not in accordance with these procedures shall no longer be authorized after that date.)

1. Local-Area, Common-Use frequencies are allotted for use by all U.S. Government agencies and are to provide for radio communications that do not justify the assigning of a radio frequency exclusively to that use, i.e., the frequency can be shared with other users. Coordination in accordance with Section 8.3.18 of this Manual is not required.

a. The following paired frequencies are to be used only for local area operations requiring the use

of a repeater station at a fixed location. Unpaired, single frequency operations will be permitted on the repeater transmit frequencies, and on the repeater receive frequencies, only if all other local-area, common-use frequencies are in use, but only upon showing that none of the unpaired frequencies in subparagraph b., below, are available:

Frequencies (MHz)	
Repeater Transmit	**Repeater Receive**
173.625	167.1375
407.525	416.525
409.075	418.075

The frequency 409.075 MHz shall not be used in the U.S./Canada Border Areas unless prior coordination has been effected with Canada under the provisions of paragraphs 3.9 and 3.10 of Section 3.4.7 of this Manual, or the output power is 5 watts or less and interference does not occur to Canadian operations.

b. The following frequencies shall be used only for local area operations that do not require the use of a repeater station, and shall be used only in a simplex mode (use of base stations is allowed):

Frequencies (MHz)	
168.6125	163.7125
412.875	412.8875
412.9	412.9125

2. All operations shall be authorized in accordance with Chapter 9 of this Manual. The frequencies are available on a shared, non-priority basis only, and will not be authorized for, nor are they intended, for the exclusive use of any one agency. No protection from interference will be provided to any station operating on these frequencies from other stations operating on the same frequency. The use of equipment with coded squelch is strongly encouraged to reduce nuisance interference from other users.

3. These allotments are for use by Government stations in the Land and Maritime Mobile Services (Table of Services, Station Classes, and Stations, Chapter 6, Section 6.1.4 of this Manual refers), and the following restrictions apply.

a. The minimum ERP necessary to support the intended use shall be employed;

b. the maximum base or mobile station transmitter output power shall not exceed 30 Watts;

c. the gain of the base station (or repeater station) antenna shall not exceed 6 dBi;

d. the height of the base station (or repeater station) antenna shall not exceed 6 meters above the height of the structure supporting the antenna;

e. all equipment shall conform to Part 5.3 of this Manual;

f. radius of operation for mobile stations is limited to 50 kilometers.

4. Applications for assignments on the frequencies listed in subparagraphs 1.a. and 1.b., above, shall be affixed with Record Note S356, "This assignment is for a local-area, common-use frequency pursuant to Section 4.2.6 of the NTIA Manual."

4.3 FREQUENCY PLANS

4.3.1 CW Phase Comparison Radiolocation Plan

This plan provides for the use of frequencies for low power, medium and high frequency radiolocation systems employing harmonically related N0N emission phase comparison frequencies and associated 1KA2D emission data link frequencies. These systems normally operate to distances of approximately 400 kilometers offshore and to considerably lesser distances inland.

The following phase comparison frequencies with N0N emission are available for assignment in all areas. Frequency assignments for a band of frequencies shall not be made. Where equipment or other limitations make it impracticable to operate on these channels, applications for other suitable frequencies will be considered on a case-by-case basis.

1650.0-1655.0 kHz

1650.0	1651.0	1652.0	1653.0	1654.0
1650.1	1651.1	1652.1	1653.1	1654.1
1650.2	1651.2	1652.2	1653.2	1654.2
1650.3	1651.3	1652.3	1653.3	1654.3
1650.4	1651.4	1652.4	1653.4	1654.4
1650.5	1651.5	1652.5	1653.5	1654.5
1650.6	1651.6	1652.6	1653.6	1654.6
1650.7	1651.7	1652.7	1653.7	1654.7
1650.8	1651.8	16528	1653.8	1654.8
1650.9	1651.9	1652.9	1653.9	1654.9
				1655.0

3300.4-3310.4 kHz

3300.4	3302.4	3304.4	3306.4	3308.4
3300.6	3302.6	3304.6	3306.6	3308.6
3300.8	3302.8	3304.8	3306.8	3308.8
3301.0	3303.0	3305.0	3307.0	3309.0
3301.2	3303.2	3305.2	3307.2	3309.2
3301.4	3303.4	3305.4	3307.4	3309.4
3301.6	3303.6	3305.6	3307.6	3309.6
3301.8	3303.8	3305.8	3307.8	3309.8
3302.0	3304.0	3306.0	3308.0	3310.0
3302.2	3304.2	3306.2	3308.2	3310.2
				3310.4

The assignment of suitable frequencies for the associated data links with 1KA2D emission shall be considered on a case-by-case basis.

The mean antenna power shall be limited to 100 watts for both N0N and 1KA2D emissions. Only radiolocation land stations and radiolocation mobile stations shall be authorized.

The designated frequencies shall be authorized on a shared non-priority basis only and shall not be authorized for the exclusive use of any one agency. Any harmful interference that may develop between authorized radiolocation operations shall be resolved locally by coordination between the users involved.

Frequency assignments shall be for a temporary period not to exceed two years, and may be renewed.

4.3.2 Plan for Wireless Microphones in the Band 162-174 MHz

The following channels have been allotted for use by wireless microphone systems under the conditions listed in (a) through (e) below:

169.445 MHz	171.045 MHz
169.505 MHz	171.105 MHz
170.245 MHz	171.845 MHz
170.305 MHz	171.905 MHz

(a) The emission bandwidth shall not exceed 54 kHz.

(b) The output power shall not exceed 50 milliWatts.

(c) The frequency stability of wireless microphones shall limit the total emission to within ±32.5 kHz of the assigned frequency.

(d) All wireless microphone use will be on an unprotected basis and further will be on a non-interference basis to authorized Government and non-Government users with the exception of other wireless microphone users.

(e) Assignment applications for wireless microphone use will be considered on a case-by-case basis by the Frequency Assignment Subcommittee (FAS); and, assignment applications do not need to be coordinated with the Hydrology Subcommittee.

4.3.3 Plan for Hydrologic and Meteorological Operations in the Bands 162-174 and 406.1-420 MHz

1. Hydrologic Channels. This plan identifies the center frequencies of channels used primarily for hydrologic operations.

MHz	MHz	MHz	MHz
169.425	170.2625	171.1000	406.1250
169.4375	170.2750	171.1125	406.1750
169.4500	170.2875	171.1250	412.6625
169.4625	170.3000	171.8250	412.675
169.4750	170.3125	171.8375	412.6875
169.4875	170.3250	171.8500	412.7125
169.5000	171.025	171.8625	412.7250
169.5125	171.0375	171.8750	412.7375
169.5250	171.0500	171.8875	412.7625
170.2250	171.0625	171.9000	412.775
170.2375	171.0750	171.9125	415.1250
170.2500	171.0875	171.9250	415.1750

a. Use by Government Agencies.

Government agencies may use the frequencies listed in the table above only for hydrologic operations, except as indicated in Section 8.3.6 of this Manual.

b. Use by Non-Government Agencies. As provided in Allocation footnote US13, non-Government fixed stations may use the frequencies listed in the table above for the specific purpose of transmitting hydrologic and meteorological data in cooperation with agencies of the Federal Government.

c. Coordination. Agencies must coordinate with the Hydrology Subcommittee of the Federal Interagency Advisory Committee on Water Data, as prescribed in Section 8.3.6 of this Manual, when applying for an assignment on one of the frequencies listed in the table above.

d. Narrowband Hydrologic Operations. All new hydrologic systems are required to operate with a necessary bandwidth of less than 12.5 kHz, and may use all the frequencies shown in the table above.

e. Wideband Hydrologic Operations.

Existing systems authorized in the 162-174 MHz band may continue using equipment operating with necessary bandwidths equal to, or greater than, 12.5 kHz, using the center frequencies listed in the table above that are spaced 25 kHz apart and in the columns beginning with 169.425, 170.2625, and 171.1000 MHz, until December 31, 2004. After this date all such operations must have been converted to narrowband equipment operating with a necessary bandwidth of less than 12.5 kHz. In addition, existing systems operating in the 406.1-420 MHz band may, until December 31, 2007, continue using equipment operating with necessary bandwidths of 12.5 kHz or greater on the following frequencies: 406.125, 406.175, 409.675, 409.725, 412.625, 412.675, 412.725, and 412.775 MHz. After December 31, 2007, all hydrologic systems in the 406.1-420 MHz band must have transitioned to the center frequencies listed in the table above, and to equipment operating with necessary bandwidths of less than 12.5 kHz. New assignments on frequencies 406.1250 and 406.1750 MHz are to be primarily for paired operations with frequencies 415.1250 and 415.1750 MHz, respectively.

2. Meteorological and Quasi-Hydrologic Operations. The frequency 171.175 MHz is allotted for meteorological and quasi-hydrologic operations. Coordination with the Hydrology Subcommittee is not required.

4.3.4 Telemetering Plans

1. For the Band 1435-1535 MHz

a. Ninety-nine (99) one-megahertz channels are designated for use for telemetering and associated telecommand during the flight testing of manned or unmanned aircraft, missiles, or major components thereof (Station Classes MOEA, FLEA, MOD, FLD--see Chapter 6).

b. All assignments will be centered on frequencies at standard intervals of 1 MHz, beginning at 1435.5 MHz, and will be authorized bandwidths of 1, 3, or 5 MHz. Assignments with bandwidths greater than 1 MHz will be centered so that they do not extend outside the allocated band.

c. The frequencies 1444.5, 1453.5, 1501.5, 1515.5, 1524.5 and 1525.5 MHz will be shared with flight telemetering mobile stations (Station Classes MOEB, FLEB, MOD, FLD--see Chapter 6). Such uses will be limited to 1 MHz bandwidths except for frequencies 1524.5 and 1525.5 MHz where a bandwidth up to 2 MHz is permitted.

d. Included as permissible use of the 1435-1535 MHz band is telemetry associated with launching and reentry into the Earth's atmosphere, as well as any incidental orbiting prior to reentry, of manned or unmanned objects undergoing flight tests (Station Classes MOEA, FLEA, MOD, FLD apply).

e. Telecommand stations authorized operation in the 1435-1535 MHz band will:

(1) Directly support flight test aeronautical telemetering functions;

(2) Be limited to 1 MHz bandwidth; and,

(3) Use antennas having a half power beamwidth of no more than 8 degrees and a front-to-back ratio of at least 20 dB.

f. In the band 1435-1535 MHz, the channels designated for aeronautical telemetering are also available for space telemetering on a shared basis.

2. For the Band 2200-2300 MHz

a. In the band 2200-2290 MHz, 90 one-megahertz narrowband channels are designated, centered on 2200.5 MHz and each one-megahertz increment thereafter, through and including 2289.5 MHz. The use of emission bandwidths greater than 1 MHz is permitted, provided the assigned frequencies are centered on the center frequencies of narrowband channels. These channels are available for a) telemetering from space research space stations irrespective of their trajectories and b) aeronautical telemetering, including telemetry associated with launch vehicles, missiles, and upper atmosphere research rockets. Such use is on a coequal shared basis with fixed and mobile line-of-sight operations in the band conducted in accordance with the Government Table of Frequency Allocations. No provision is made in this band for the

flight testing of manned aircraft.

b. In the band 2290-2300 MHz, no specific channels have been established.

3. For the Band 2310-2390 MHz--The following applies to Mobile Telemetry and Associated Telecommand:

a. Seventy-three (73) one-megahertz channels are designated for use for telemetering and associated telecommand during the flight testing of manned or unmanned aircraft, missiles, or major components thereof (Station Classes MOEA, FLEA, MOD, FLD--see Chapter 6).

b. All assignments will be centered on frequencies at standard intervals of 1 MHz, beginning at 2310.5 MHz, and will normally be authorized bandwidths of 1, 3, or 5 MHz. Wider bandwidths may be authorized on a case-by-case basis to equipment capable of tuning the entire band. Assignments with bandwidths greater than 1 MHz will be centered so that they do not extend outside the allocated band. Telecommand assignments will be limited to 1 MHz bandwidths (see 3.d below)

c. The frequencies 2312.5, 2332.5, 2352.5, 2364.5, 2370.5, and 2382.5 MHz are also designated for use by both Government and non-Government stations on a co-equal basis for telemetering and associated telecommand operations of expendable and re-usable launch vehicles whether or not such operations involve flight testing. Such uses will be limited to 1 MHz bandwidths. (Station classes MOEA, MOEB, MOD, FLEA, FLEB, and FLD apply).

d. Telecommand stations, except as noted in 3c, above, authorized operation in the 2310-2390 MHz band will:

(1) Directly support flight test aeronautical telemetering functions;

(2) Be limited to 1 MHz bandwidth; and,

(3) Use antennas having a half power beamwidth of no more than 8 degrees and a front-to-back ratio of at least 20 dB.

4.3.5 VHF/UHF Plan for Aeronautical Radionavigation

TACAN-DME and VOR comprise the short-distance air navigational system in the common civil/military National Airspace System (NAS). TACAN is capable of providing range and azimuth information to aircraft. Normally range-only information is received by civil aircraft. DME provides range only and VOR provides azimuth only.

Frequencies at 1-MHz increments in the 960-1215 MHz band are used in airborne interrogating and ground transponder equipment as shown in the channel arrangement depicted below. This channel-pairing arrangement, which has been adopted by ICAO for facilities supporting operations in the international aeronautical service, also serves as a basis for all frequency planning and assignments for the NAS. TACAN and DME frequencies are designated on aeronautical charts by channel numbers 1-126. TACAN channels in the National Airspace System plan are paired with VOR or ILS localizer frequencies in the 108-118 MHz band and with glide slope frequencies in the 328.6-335.4 MHz band, as shown. This pairing arrangement facilitates the employment of a VOR in conjunction with a TACAN-DME beacon to form a VORTAC facility to provide simultaneous azimuth and range information to civil aircraft. Similarly TACAN-DME beacons may be paired with ILS facilities to provide both range and terminal guidance (azimuth and glide slope) information to properly equipped aircraft.

When a TACAN or DME transponder is intended to operate in association with a VHF navigational facility (VOR or ILS), the transponder is collocated with the VHF facility and frequency paired with it. If the system is to be used for terminal services such as for airport approach or landing, the facilities are considered to be collocated only if the transponder and VHF antennas are not more than 260 feet (80 meters) apart. For enroute procedures, collocation is considered to exist if the antenna separation does not exceed 2,000 feet (610 meters). Where the separation exceeds these figures, a VOR/ILS frequency from one pair and the TACAN-DME frequency from another pair must be assigned and suitable notations made on aeronautical charts to alert the user that he is not receiving azimuth and range information from

the same point.

TACAN channels 17-59 and 70-126 are designated for use in the National Airspace System. Frequency assignments on these channels and for VOR and ILS operations are managed by the Aeronautical Assignment Group (AAG) of the FAS, under the provisions of sections 1.4.1 and 9.14.1. Most of these TACAN channels are used by the FAA to provide air navigation services.

Channels 1-16 and 60-69 are designated for the military services for tactical uses and are not used in the NAS. The frequency subbands matching these channel designators are assigned to the military departments for use throughout the U. S. and Possessions. Assignments of specific frequencies to areas and locations are accomplished by individual military departments after appropriate coordination between departments. Land and shipborne beacons operating on these channels, as well as airborne beacons for air-to-air operations provide both azimuth and range information to military aircraft.

The FAA recognizes the need of the military services to use NAS frequencies for tactical purposes, including air-to-air operations, on a secondary basis. The military services recognize the need for frequency adjustments to provide protection for new or reclassified facilities of the NAS. Assignments and adjustments in support of these facilities shall be coordinated on a case-by-case basis through the AAG.

To minimize the possibility of harmful interference between the NAS and military operations, the FAA shall make every effort to avoid the use of TACAN Channels 17, 59, and 70 in areas of concentrated fleet activity. The military services shall coordinate in advance with the FAA relative to the use of TACAN Channels 16, 60, and 69 for land-based facilities.

Assignments of TACAN channels in the operational environment of ground radar facilities equipped with Selective Identification Features (SIF) of Secondary Surveillance Radars (SSR) must be considered carefully, in order to avoid interference. The ground SIF/SSR interrogator transmits on 1030 MHz (TACAN Channel 6 interrogator frequency) and the airborne SIF/SSR transponder transmits on 1090 MHz (TACAN Channel 66 interrogator frequency).

Channel	VOR MHz	DME/TACAN				ILS	
		Airborne		Ground			
		Int. Freq. MHz	Pulse Code μsec	Reply Freq. MHz	Pulse Code μsec	Localizer MHz	Glide Slope MHz
1X		1025	12	962	12		
1Y		1025	36	1088	30		
2X		1026	12	963	12		
2Y		1026	36	1089	30		
3X		1027	12	964	12		
3Y		1027	36	1090	30		
4X		1028	12	965	12		
4Y		1028	36	1091	30		
5X		1029	12	966	12		
5Y		1029	36	1092	30		
6X		1030	12	967	12		
6Y		1030	36	1093	30		
7X		1031	12	968	12		
7Y		1031	36	1094	30		
8X		1032	12	969	12		
8Y		1032	36	1095	30		
9X		1033	12	970	12		
9Y		1033	36	1096	30		
10X		1034	12	971	12		

Channel	VOR MHz	DME/TACAN				ILS	
		Airborne		Ground			
		Int. Freq. MHz	Pulse Code μsec	Reply Freq. MHz	Pulse Code μsec	Localizer MHz	Glide Slope MHz
10Y		1034	36	1097	30		
11X		1035	12	972	12		
11Y		1035	36	1098	30		
12X		1036	12	973	12		
12Y		1036	36	1099	30		
13X		1037	12	974	12		
13Y		1037	36	1100	30		
14X		1038	12	975	12		
14Y		1038	36	1101	30		
15X		1039	12	976	12		
15Y		1039	36	1102	30		
16X		1040	12	977	12		
16Y		1040	36	1103	30		
17X	108.00	1041	12	978	12		
17Y	108.05	1041	36	1104	30		
18X		1042	12	979	12	108.10	334.70
18Y		1042	36	1105	30	108.15	334.55
19X	108.20	1043	12	980	12		
19Y	108.25	1043	36	1106	30		
20X		1044	12	981	12	108.3	334.1
20Y		1044	36	1107	30	108.3	334.1
21X	108.40	1045	12	982	12		
21Y	108.45	1045	36	982	30		
22X		1046	12	983	12	108.5	329.9
22Y		1046	36	1109	30	108.55	329.75
23X	108.6	1047	12	984	12		
23Y	108.65	1047	36	1110	30		
24X		1048	12	985	12	108.70	330.50
24Y		1048	36	1111	30	108.75	330.35
25X	108.80	1049	12	986	12		
25Y	108.85	1049	36	1112	30		
26X		1050	12	987	12	108.90	329.30
26Y		1050	36	1113	30	108.95	329.15
27X	109.00	1051	12	988	12		
27Y	109.05	1051	36	1114	30		
28X		1052	12	989	12	109.10	331.40
28Y		1052	36	1115	30	109.15	331.25
29X	109.20	1053	12	990	12		
29Y	109.25	1053	36	1116	30		
30X		1054	12	991	12	109.30	332.00
30Y		1054	36	1117	30	109.35	331.85

Channel	VOR MHz	DME/TACAN				ILS	
		Airborne		Ground			
		Int. Freq. MHz	Pulse Code μsec	Reply Freq. MHz	Pulse Code μsec	Localizer MHz	Glide Slope MHz
31X	109.40	1055	12	992	12		
31Y	109.45	1055	36	1118	30		
32X		1056	12	993	12	109.50	332.60
32Y		1056	36	1119	30	109.55	332.45
33X	109.60	1057	12	994	12		
33Y	109.65	1057	36	1120	30		
34X		1058	12	995	12	109.70	333.20
34Y		1058	36	1121	30	109.75	333.05
35X	109.80	1059	12	996	12		
35Y	109.85	1059	36	1122	30		
36X		1060	12	997	12	109.90	333.80
36Y		1060	36	1123	30	109.95	333.65
37X	110.00	1061	12	998	12		
37Y	110.05	1061	36	1124	30		
38X		1062	12	999	12	110.10	334.40
38Y		1062	36	1125	30	110.15	334.25
39X	110.20	1063	12	1000	12		
39Y	110.25	1063	36	1126	30		
40X		1064	12	1001	12	110.3	335
40Y		1064	36	1127	30	110.35	334.85
41X	110.40	1065	12	1002	12		
41Y	110.45	1065	36	1128	30		
42X		1066	12	1003	12	110.50	329.60
42Y		1066	36	1129	30	110.55	329.45
43X	110.60	1067	12	1004	12		
43Y	110.65	1067	36	1130	30		
44X		1068	12	1005	12	110.70	330.20
44Y		1068	36	1131	30	110.75	330.05
45X	110.80	1069	12	1006	12		
45Y	110.85	1069	36	1132	30		
46X		1070	12	1007	12	110.90	330.80
46Y		1070	36	1133	30	110.95	330.65
47X	111.00	1071	12	1008	12		
47Y	111.05	1071	36	1134	30		
48X		1072	12	1009	12	111.10	331.70
48Y		1072	36	1135	30	111.15	331.55
49X	111.20	1073	12	1010	12		
49Y	111.25	1073	36	1136	30		
50X		1074	12	1011	12	111.30	332.30
50Y		1074	36	1137	30	111.35	332.15
51X	111.40	1075	12	1012	12		

Channel	VOR MHz	DME/TACAN				ILS	
		Airborne		Ground			
		Int. Freq. MHz	Pulse Code μsec	Reply Freq. MHz	Pulse Code μsec	Localizer MHz	Glide Slope MHz
51Y	111.45	1075	36	1138	30		
52X		1076	12	1013	12	111.50	332.90
52Y		1076	36	1139	30	111.55	332.75
53X	111.60	1077	12	1014	12		
53Y	111.65	1077	36	1140	30		
54X		1078	12	1015	12	111.70	333.50
54Y		1078	36	1141	30	111.75	333.35
55X	111.80	1079	12	1016	12		
55Y	111.85	1079	36	1142	30		
56X		1080	12	1017	12	111.90	331.10
56Y		1080	36	1143	30	111.95	330.95
57X	112.00	1081	12	1018	12		
57Y	112.05	1081	36	1144	30		
58X	112.10	1082	12	1019	12		
58Y	112.15	1082	36	1145	30		
59X	112.20	1083	12	1020	12		
59Y	112.25	1083	36	1146	30		
60X		1084	12	1021	12		
60Y		1084	36	1147	30		
61X		1085	12	1022	12		
61Y		1085	36	1148	30		
62X		1086	12	1023	12		
62Y		1086	36	1149	30		
63X		1087	12	1024	12		
63Y		1087	36	1150	30		
64X		1088	12	1151	12		
64Y		1088	36	1025	30		
65X		1089	12	1152	12		
65Y		1089	36	1026	30		
66X		1090	12	1153	12		
66Y		1090	36	1027	30		
67X		1091	12	1154	12		
67Y		1091	36	1028	30		
68X		1092	12	1155	12		
68Y		1092	36	1029	30		
69X		1093	12	1156	12		
69Y		1093	36	1030	30		
70X	112.30	1094	12	1157	12		
70Y	112.35	1094	36	1031	30		
71X	112.40	1095	12	1158	12		
71Y	112.45	1095	36	1032	30		

Channel	VOR MHz	DME/TACAN				ILS	
		Airborne		Ground			
		Int. Freq. MHz	Pulse Code μsec	Reply Freq. MHz	Pulse Code μsec	Localizer MHz	Glide Slope MHz
72X	112.50	1096	12	1159	12		
72Y	112.55	1096	36	1033	30		
73X	112.60	1097	12	1160	12		
73Y	112.65	1097	36	1034	30		
74X	112.70	1098	12	1161	12		
74Y	112.75	1098	36	1035	30		
75X	112.80	1099	12	1162	12		
75Y	112.85	1099	36	1036	30		
76X	112.90	1100	12	1163	12		
76Y	112.95	1100	36	1037	30		
77X	113.00	1101	12	1164	12		
77Y	113.05	1101	36	1038	30		
78X	113.10	1102	12	1165	12		
78Y	113.15	1102	36	1039	30		
79X	113.20	1103	12	1166	12		
79Y	113.25	1103	36	1040	30		
80X	113.30	1104	12	1167	12		
80Y	113.35	1104	36	1041	30		
81X	113.40	1105	12	1168	12		
81Y	113.45	1105	36	1041	30		
82X	113.50	1106	12	1169	12		
82Y	113.55	1106	36	1043	30		
83X	113.60	1107	12	1170	12		
83Y	113.65	1107	36	1044	30		
84X	113.70	1108	12	1171	12		
84Y	113.75	1108	36	1045	30		
85X	113.80	1109	12	1172	12		
85Y	113.85	1109	36	1046	30		
86X	113.90	1110	12	1173	12		
86Y	113.95	1110	36	1047	30		
87X	114.00	1111	12	1174	12		
87Y	114.05	1111	36	1048	30		
88X	114.10	1112	12	1175	12		
88Y	114.15	1112	36	1049	30		
89X	114.20	1113	12	1176	12		
89Y	114.25	1113	36	1050	30		
90X	114.30	1114	12	1177	12		
90Y	114.35	1114	36	1051	30		
91X	114.40	1115	12	1178	12		
91Y	114.45	1115	36	1052	30		
92X	114.50	1116	12	1179	12		

Channel	VOR MHz	DME/TACAN				ILS	
		Airborne		Ground			
		Int. Freq. MHz	Pulse Code μsec	Reply Freq. MHz	Pulse Code μsec	Localizer MHz	Glide Slope MHz
92Y	114.55	1116	36	1053	30		
93X	114.60	1117	12	1180	12		
93Y	114.65	1117	36	1054	30		
94X	114.70	1118	12	1181	12		
94Y	114.75	1118	36	1055	30		
95X	114.80	1119	12	1182	12		
95Y	114.85	1119	36	1056	30		
96X	114.90	1120	12	1183	12		
96Y	114.95	1120	36	1057	30		
97X	115.00	1121	12	1184	12		
97Y	115.05	1121	36	1058	30		
98X	115.10	1122	12	1185	12		
98Y	115.15	1122	36	1059	30		
99X	115.20	1123	12	1186	12		
99Y	115.25	1123	36	1060	30		
100X	115.30	1124	12	1187	12		
100Y	115.35	1124	36	1061	30		
101X	115.40	1125	12	1188	12		
101Y	115.45	1125	36	1062	30		
102X	115.50	1126	12	1189	12		
102Y	115.55	1126	36	1063	30		
103X	115.60	1127	12	1190	12		
103Y	115.65	1127	36	1064	30		
104X	115.70	1128	12	1191	12		
104Y	115.75	1128	36	1065	30		
105X	115.80	1129	12	1192	12		
105Y	115.85	1129	36	1066	30		
106X	115.90	1130	12	1193	12		
106Y	115.95	1130	36	1067	30		
107X	116.00	1131	12	1194	12		
107Y	116.05	1131	36	1068	30		
108X	116.1	1132	12	1195	12		
108Y	116.15	1132	36	1069	30		
109X	116.20	1133	12	1196	12		
109Y	116.25	1133	36	1070	30		
110X	116.30	1134	12	1197	12		
110Y	116.35	1134	36	1071	30		
111X	116.40	1135	12	1198	12		
111Y	116.45	1135	36	1072	30		
112X	116.5	1136	12	1199	12		
112Y	116.55	1136	36	1073	30		

Channel	VOR MHz	DME/TACAN				ILS	
		Airborne		Ground			
		Int. Freq. MHz	Pulse Code μsec	Reply Freq. MHz	Pulse Code μsec	Localizer MHz	Glide Slope MHz
113X	116.6	1137	12	1200	12		
113Y	116.65	1137	36	1074	30		
114X	116.70	1138	12	1201	12		
114Y	116.75	1138	36	1075	30		
115X	116.80	1139	12	1202	12		
115Y	116.85	1139	36	1076	30		
116X	116.90	1140	12	1203	12		
116Y	116.95	1140	36	1077	30		
117X	117.00	1141	12	1204	12		
117Y	117.05	1141	36	1078	30		
118X	117.10	1142	12	1205	12		
118Y	117.15	1142	36	1079	30		
119X	117.20	1143	12	1206	12		
119Y	117.25	1143	36	1080	30		
120X	117.30	1144	12	1207	12		
120Y	117.35	1144	36	1081	30		
121X	117.40	1145	12	1208	12		
121Y	117.45	1145	36	1082	30		
122X	117.50	1146	12	1209	12		
122Y	117.55	1146	36	1083	30		
123X	117.60	1147	12	1210	12		
123Y	117.65	1147	36	1084	30		
124X	117.70	1148	12	1211	12		
124Y	117.75	1148	36	1085	30		
125X	117.80	1149	12	1212	12		
125Y	117.85	1149	36	1086	30		
126X	117.90	1150	12	1213	12		
126Y	117.95	1150	36	1087	30		

4.3.6 Channeling Plan for Assignments in the Band 29.89-50 MHz

This plan is a guide for identifying the center frequencies normally used for assignments with necessary bandwidths equal to or less than 16 kHz.

CONDITIONS AND LIMITATIONS

1. Narrowband Operations. Assignments with necessary bandwidths equal to or less than 16 kHz (narrowband assignments) may be authorized on the center frequencies shown in this plan and on qualified interstitial channels. A "qualified interstitial channel" is one which:

a. Has a center frequency which falls exactly halfway between two adjacent center frequencies shown in this plan,

b. does not overlap an all-government-agencies (AGA) channel,

c. will result in more efficient use of the spectrum, and

d. has been properly coordinated with all affected agencies.

2. Wideband Operations. Assignments with necessary bandwidths greater than 16 kHz (wideband assignments) may also be authorized in this band, provided such assignments:

a. do not exceed 40 kHz of necessary bandwidth,

b. do not overlap an all-government-agencies (AGA) channel,

c. are positioned between the center frequencies shown in this plan when this will result in more efficient use of the spectrum,

d. have been properly coordinated with all affected agencies, and

e. are needed to satisfy requirements which cannot be accommodated with narrowband state-of-the-art equipment, or

f. are in direct support of military tactical and training operations which conform to the conditions and limitations of Section 7.15.4.

3. Use of Coded Squelch. Coded squelch (squelch control techniques) will be used whenever this technique will promote more efficient use of the spectrum; e.g. use of fewer frequencies, sharing of frequencies, reduction or elimination of interference, etc.

EXCEPTIONS

Exceptions to the above conditions and limitations will be considered by the FAS on a case-by-case basis.

29.9						
30.01	32.01	34.01	36.01		40.01	41.01
30.03	32.03	34.03	36.03		40.03	41.03
30.05	32.05	34.05	36.05		40.05	41.05
30.07	32.07	34.07	36.07		40.07	41.07
30.09	32.09	34.09	36.09		40.09	41.09
30.11	32.11	34.11	36.11		40.11	41.11
30.13	32.13	34.13	36.13		40.13	41.13
30.15	32.15	34.15	36.15		40.15	41.15
30.17	32.17	34.17	36.17		40.17	41.17
30.19	32.19	34.19	36.19		40.19	41.19
30.21	32.21	34.21	36.21		40.21	41.21
30.23	32.23	34.23	36.23		40.23	41.23
30.25	32.25	34.25	36.25		40.25	41.25
30.27	32.27	34.27	36.27	38.27	40.27	41.27
30.29	32.29	34.29	36.29	38.29	40.29	41.29
30.31	32.31	34.31	36.31	38.31	40.31	41.31
30.33	32.33	34.33	36.33	38.33	40.33	41.33
30.35	32.35	34.35	36.35	38.35	40.35	41.35
30.37	32.37	34.37	36.37	38.37	40.37	41.37
30.39	32.39	34.39	36.39	38.39	40.39	41.39
30.41	32.41	34.41	36.41	38.41	40.41	41.41
30.43	32.43	34.43	36.43	38.43	40.43	41.43
30.45	32.45	34.45	36.45	38.45	40.45	41.45
30.47	32.47	34.47	36.47	38.47	40.47	41.47
30.49	32.49	34.49	36.49	38.49	40.49	41.49
30.51	32.51	34.51	36.51	38.51	40.51	41.51
30.53	32.53	34.53	36.53	38.53	40.53	41.53

30.55	32.55	34.55	36.55	38.55	40.55	41.55		
	32.57	34.57	36.57	38.57	40.57	41.57		
	32.59	34.59	36.59	38.59	40.59	41.59		
	32.61	34.61	36.61	38.61	40.61	41.61	46.61	49.61
	32.63	34.63	36.63	38.63	40.63	41.63	46.63	49.63
	32.65	34.65	36.65	38.65	40.65	41.65	46.65	49.65
	32.67	34.67	36.67	38.67	40.67	41.67	46.67	49.67
	32.69	34.69	36.69	38.69	40.69	41.69	46.69	49.69
	32.71	34.71	36.71	38.71	40.71	41.71	46.71	49.71
	32.73	34.73	36.73	38.73	40.73	41.73	46.73	49.73
	32.75	34.75	36.75	38.75	40.75	41.75	46.75	49.75
	32.77	34.77	36.77	38.77	40.77	41.77	46.77	49.77
	32.79	34.79	36.79	38.79	40.79	41.79	46.79	49.79
	32.81	34.81	36.81	38.81	40.81	41.81	46.81	49.81
	32.83	34.83	36.83	38.83	40.83	41.83	46.83	49.83
	32.85	34.85	36.85	38.85	40.85	41.85	46.85	49.85
	32.87	34.87	36.87	38.87	40.87	41.87	46.87	49.87
	32.89	34.89	36.89	38.89	40.89	41.89	46.89	49.89
	32.91	34.91	36.91	38.91	40.91	41.91	46.91	49.91
	32.93	34.93	36.93	38.93	40.93	41.93	46.93	49.93
	32.95	34.95	36.95	38.95	40.95	41.95	46.95	49.95
	32.97	34.97	36.97	38.97	40.97	41.97	46.97	49.97
	32.99	34.99	36.99	38.99	40.99	41.99	46.99	49.99

4.3.7 Channeling Plan for Assignments in the Band 162-174 MHz (12.5 kHz Plan)*

The channeling plan for the band 162-174 MHz is a guide for identifying the center frequencies used for assignments with necessary bandwidths less than 12.5 kHz. The channeling plan is composed of 942 channels beginning with the center frequency 162.0125 MHz with intervals of 12.5 kHz, excluding frequencies contained within the sub-band 173.2-173.4 MHz.

CONDITIONS AND LIMITATIONS

1. Narrowband Operations. Narrowband assignments (with a necessary bandwidth of less than 12.5 kHz) may be authorized on the center frequencies identified in this plan. Narrowband assignments should not be made on channels adjacent to wideband assignments without consideration is given to additional distance separation that may be required due to the increased potential to potential adjacent channel interference and after coordination with affected agencies.

After January 1, 1995, all new systems, and after January 1, 2005, all systems in the 162-174 MHz band must be capable of operating within a 12.5 kHz channel in accordance with the provisions set forth in Chapters 4 and 5 of the NTIA Manual.

2. Wideband Operations. Wideband assignments (with necessary bandwidths equal to or greater than 12.5 kHz) for new systems are not authorized. Renewals for wideband assignments may be granted up to January 1, 2005, at which time, all assignments must conform to the provisions set forth in paragraph 1 above and Section 5.3.5 of this Manual. As an exception, NOAA Weather Radio operations on channels in the frequency range 162.3625-162.5875 MHz may continue to operate with necessary bandwidths equal to 16 kHz.

Wideband assignments may continue to be authorized with an approved waiver. Requests for waivers must be submitted to the Frequency Assignment Subcommittee (FAS) for approval by NTIA.

Requests for waivers should be submitted to the FAS no later than July 1, 2004 to facilitate the transition to 12.5 kHz channels by indicating to the agencies which channels are likely to remain encumbered with 25 kHz use and the period that the encumbrance is expected to remain. Due to the importance of moving toward the more efficient technology, NTIA will approve waivers only where it can determine that the goal of the agencies to narrowband is not being impeded. Systems operating on wideband assignments without waivers will operate on a non-interference basis on January 1, 2005.

3. Use of Coded Squelch. Coded squelch (squelch control techniques) will be used whenever this technique will promote more efficient use of the spectrum; e.g. use of fewer frequencies, sharing of frequencies, reduction or elimination of interference, etc.

4. Time Division Multiple Access (TDMA) Operations. TDMA systems, with at least 1 voice channel per 12.5 kHz, will be allowed and can be accommodated on adjacent 12.5 kHz channels listed in this channeling plan. The center frequency of the TDMA channel must be offset midway between the existing narrowband channels to avoid adjacent channel

interference problems with existing or planned narrowband systems. Refer to Part 5.3.6 for technical standards.

5. Paired Frequency Operations. The channeling plan identifies 294 pairs of frequencies that are intended to be used for two-frequency simplex operations using equipment operating with a necessary bandwidth less than 12.5kHz.

a. For paired frequency operations, the frequencies in the range 162.0625-166.4875 MHz will be used for land station receive (or mobile transmit), and frequencies in the range 169.5125-173.9875 MHz will be used for land station transmissions (or mobile receive).

b. Base stations with a power not greater than 125 Watts are permitted to transmit in the range 162.0625-166.4875 MHz for access to the repeater.

c. Mobile stations are permitted to use repeater transmit frequencies for talk-around communications.

d. Unpaired single frequency operations may be authorized using either of the paired frequencies, except pairs allotted AGA, if the requesting agency believes it to be a more effective use of the spectrum.

e. Existing assignments that do not conform to the provisions of this paragraph are grand fathered until 01/01/19. Additionally, expansion of existing systems will continue to be authorized within this period of time.

6. Single Frequency Operations. The channeling plan identifies 354 center frequencies that are intended to be used for single frequency operations with necessary bandwidths less than 12.5 kHz.

7. Use of the Band by Military Agencies. Use of the band 162-174 MHz by the military agencies is limited to non-tactical or intra-base radio operations with the following provisions:

a. Frequency assignments may be authorized on the center frequencies designated AF/AR.

b. Frequency assignments for certified trunked systems may be authorized on the center frequencies allotted primarily for non-military agencies or AGA, subject to the conditions imposed on the NTIA certification of spectrum support and coordination between the affected agencies. The priority note P074 shall be applied to assignments on center frequencies allotted primarily for non-military agencies and those allotted for shared use, unless the agency(ies) to which the frequency is primarily allotted agrees to waive this requirement. Applicant agencies obtaining waivers to the imposition of P074 on any assignment shall include in the assignment application the coordination note C095 (see Section 9.8.2, paragraph 18, and Annex A). If a waiver agreement contains any special arrangements, the terms or text of the arrangements must be submitted to the FAS Secretary, where an FAS administrative document number will be assigned. Reference to these arrangements (using the FAS administrative document number as a reference) also shall be included in the frequency assignment application as an *M002 note entry in the Circuit Remarks (see Section 9.8.2, paragraph 39k, Annex A).

c. Frequency assignments for purposes other than trunked systems may be authorized on the center frequencies allotted primarily for non-military agencies or AGA, provided the proper selection and

coordination procedures have been followed, and provided the priority note P074 is applied to each such assignment.

8. Exceptions to the above conditions, limitations, and frequency selection/coordinaion procedures will be considered by the FAS on a case-by-case basis.

4.3.8 Channeling Plan for Splinter Channel Assignments in the Band 162-174 MHz (25 kHz Plan)*

The frequencies shown in this plan are available for assignment to all Government agencies in accordance with allocation footnote G5 and as specified herein.

162.590625[1]	163.390625[1]	164.003125[1]	165.803125[1]	166.415625[1]	167.190625[1]	171.215625[1]	173.190625[1]
.593750[2]	.393750[2]	.006250[2]	.806250[2]	.418750[2]	.193750[2]	.218750[2]	.193750[2]
.596875[1]	.396875[1]	.009375[1]	.809375[1]	.421875[1]	.196875[1]	.221875[1]	.196875[1]
.803125[1]	.603125[1]	164.840625[1]		.653125[1]	.803125[1]	.403125[1]	
.806250[2]	.606250[2]	.843750[2]		.656250[2]	.806250[2]	.406250[2]	
.808375[1]	.609375[1]	.846875[1]		.658375[1]	.809375[1]	.409375[1]	
	.790625[1]						
	.793750[2]						
	.796875[1]						

[1] These frequencies are available for operations requiring a bandwidth up to 5 kHz.

[2] These frequencies are available for operations requiring a bandwidth between 5 and 10 kHz, inclusive.

CONDITIONS FOR USE

1. Use of voice will not be authorized except for maintenance support of the primary operation. Any authorized emission will be construed to permit use of voice for this purpose, provided such use does not exceed the authorized bandwidth.

2. Audio tone frequencies may be entered on applications in the CIRCUIT REMARKS field following the identifying code *AGN. Use of a continuous carrier with the associated tone may be indicated, including use of a continuous tone transmitted simultaneously only when other tones that carry the intelligence are transmitted.

Examples: *AGN, 450, 475, 625; *AGN, 450, 475C, 625.

3. The technical standards applicable to the use of the splinter channels listed above are shown in Section 5.3.6.

4. Directional antennas shall be used where practicable on point-to-point circuits.

5. Prior to filing an application for a splinter channel with footnote 1, coordination shall be effected with any agency with adjacent channel assignments within the same splinter channel in the same geographic area.

* This Plan is effective until January 1, 2005 for systems existing prior to January 1, 1995. On January 1, 2005, this Plan is no longer effective and is replaced by the Narrow-band Channeling Plan (See Section 4.3.8a).

4.3.8A Channeling Plan for Low Power Non-Voice Assignments in the Band 162-174 MHz (12.5 kHz Plan)

The frequencies shown in this plan are available for assignment to all Government agencies in accor-

dance with allocation footnote G5 and as specified herein.

162.596875[2]	163.396875[2]	164.0[1]	165.796875[2]	166.421875[2]	167.196875[2]	171.221875[2]
.6[1]	.4[1]	164.003125[2]	.8[1]	.425000[1]	.2[1]	.225[1]
.603125[2]	.403125[2]	.009375[2]	.803125[2]	.428125[2]	.203125[2]	.228125[2]
.796875[2]	.596875[2]	.0125[1]	.809375[2]	.646875[2]	.796875[2]	.396875[2]
.8[1]	.6[1]	.015625[2]	.8125[1]	.650000[1]	.8[1]	.4[1]
.803125[2]	.603125[2]	.846875[2]	.815625[2]	.653125[2]	.803125[2]	171.403125[2]
.809375[2]	.609375[2]	.85[1]		.659375[2]	.809375[2]	.409375[2]
.81250[1]	.6125[1]	.853125[2]		.662500[1]	.8125[1]	.4125[1]
.815625[2]	.615625[2]			.665625[2]	.815625[2]	.415625[2]
	.796875[2]					
	.8[1]					
	.803125[2]					
	163.996875[2]					

[1] These frequencies are available for operations requiring a bandwidth up to 11 kHz.

[2] These frequencies are available for operations requiring a bandwidth up to 5 kHz.

CO**NDITIONS FOR USE**

1. Use of voice will not be authorized except for maintenance support of the primary operation.
2. The technical standards applicable to the use of the channels listed above are shown in Section 5.3.6.
3. Directional antennas shall be used where practicable on point-to-point circuits.
4. Transmitter output power shall not exceed 5 watts.
5. Wherever practical, frequencies in the 406.1-420 MHz band, (Section 4.3.9) or the 932.5-935 and 941.5-944 MHz bands, (Section 4.3.14) should be used in lieu of the above frequencies.
6. Exceptions to these conditions will be considered on a case-by-case basis.

4.3.9 Channeling Plan for Assignments in the Band 406.1-420 MHz

This plan is a guide for identifying the center frequencies normally used for assignments with necessary bandwidths less than 12.5 kHz and, until December 31, 2007, for assignments with necessary bandwidths of 12.5 kHz or greater. Tables 1 and 2, below, list the center frequencies of the channels for assignments in the band 406.1-420 MHz. Table 1 contains 391 pairs of frequencies that are to be used primarily for two-frequency simplex operations. Table 2 contains 329 center frequencies that are to be used for single frequency operations.

CONDITIONS AND LIMITATIONS

1. Transition. To allow for an orderly transition from previous channel plans to this plan, the following apply:

a. Agencies shall develop transition plans that outline their plans to narrowband and to change frequencies where necessary. The transition plans will provide an estimated date for narrow banding each assignment not already narrowbanded, and for changing frequencies where necessary. The initial plans

shall be presented to the FAS no later than the first FAS meeting held in the year 2001.

b. Agencies having assignments on, or overlapping, frequencies allotted for primary use by other agencies, shall make every attempt to move their operations to frequencies allotted primarily for their own use, or to frequencies allotted for their shared use. All moves shall be done at the earliest possible date, but by no later than December 31, 2007, unless a waiver (an authorization for continued assignment) is recommended by the IRAC's Frequency Assignment Subcommittee (FAS) and approved by NTIA.

c. Any assignment authorized prior to December 31, 2007, and continued in use after that date, that is on, or overlaps, a frequency allotted for primary use by another agency, shall be vacated by the using agency(ies) within 180 days of a formal notice of requirement from the agency to which the frequency is allotted, provided the notifying agency has demonstrated a valid requirement for the frequency and the FAS recommends the using agency vacate the assignment.

2. Narrowband Operations. Assignments for transmitters with necessary bandwidths less than 12.5 kHz (i.e., narrowband assignments) may be authorized on all of the center frequencies shown in Tables 1 and 2 of this plan. However, until January 1, 2008, narrowband assignments should not be made on center frequencies adjacent to wideband assignments (assignments with bandwidths of 12.5 kHz or greater), unless consideration is given to additional distance separation that may be required due to the increased potential for adjacent channel interference, and then only after proper coordination with affected agencies.

3. *Wideband Operations*. Renewal of assignments to existing stations with necessary bandwidths of 12.5 kHz or greater may be authorized until December 31, 2007. Assignments for expansion stations within existing networks operating with bandwidths of 12.5 kHz or greater may also be authorized, but only on the center frequencies listed for the even numbered channels beginning with channel 2 in Table 1 and Channel 392 in Table 2. All such assignments must bear Record Note S391 (see Annex A). By January 1, 2008, all assignments and equipment must conform to the provisions set forth in paragraph 1, above, and Section 5.3.5 of this Manual. The Automated Surface Observing System (ASOS) operations centered on channels 318 and 388 may continue to operate with necessary bandwidths greater than 12.5 kHz, but less than 25 kHz. Exceptions to these rules may be authorized on a case-by-case basis, provided the assignment with bandwidth(s) of 12.5 kHz or greater is needed to satisfy requirements, has been properly coordinated with all affected agencies, and has been recommended for approval by the FAS. However, the rule outlined in subparagraph 1c, above, applies.

4. Use of Coded Squelch. Coded squelch (squelch control techniques) will be used whenever this technique will promote more efficient use of the spectrum (e.g., use of fewer frequencies, sharing frequencies, or reduction or elimination of interference).

5. Time Division Multiple Access (TDMA) Operations. TDMA systems with at least one voice channel per 12.5 kHz will be allowed and accommodated on adjacent 12.5 kHz center frequencies listed in this channeling plan. The center frequency of the TDMA emission must be offset midway between the center frequencies listed in this plan to limit adjacent channel interference problems with existing or planned narrowband operations. Refer to Part 5.3 of this Manual for technical details.

6. Paired Frequency Operations. Table 1 contains a list of 391 pairs of frequencies that are to be used primarily for two-frequency simplex operations using equipment operating with a necessary bandwidth less than 12.5kHz.

a. For paired frequency operations, the frequencies in the range 406.1125-410.9875 MHz will be used for land station transmissions (or mobile receive), and frequencies in the range 415.1125-419.9875 MHz will be used for land station receive (or mobile transmit).

b. Base stations operating with a power not greater than 125 watts are permitted to transmit in the range 415.1125-419.9875 MHz for access to the repeater.

c. Mobile stations are permitted to use repeater transmit frequencies for talk-around communications.

d. Unpaired single frequency operations may be authorized using either of the paired frequencies, except those allotted , if the requesting agency believes it to be a more effective use of the spectrum. All such assignments must bear Record Note S396 (see Annex A). However, as long as an agency has assignments for unpaired single frequency operations on frequencies listed in Table 1, that agency shall not be authorized paired frequency assignments on those frequencies in Table 1 allotted AGA, unless justified otherwise.

7. Single Frequency Operations. Table 2 contains a list of 329 center frequencies that are to be used for single frequency operations with necessary bandwidths less than 12.5 kHz.

8. Use of the Band by Military Agencies. Use of the band 406.1-420 MHz by the military agencies is limited to non-tactical or intrabase radio operations with the following provisions:

a. Frequency assignments may be authorized on center frequencies allotted primarily for DOD.

b. Frequency assignments for certified trunked systems may be authorized on the center frequencies allotted primarily for non-military agencies or AGA, subject to the conditions imposed on the NTIA certification of spectrum support and coordination between the affected agencies. The priority note P076 shall be applied to assignments on center frequencies allotted primarily for non-military agencies and those allotted for shared use, unless the agency(ies) to which the frequency is primarily allotted agrees to waive this requirement. Applicant agencies obtaining waivers to the imposition of P076 on any assignment shall include in the assignment application the coordination note C095 (see Section 9.8.2, paragraph 18, and Annex A). If a waiver agreement contains any special arrangements, the terms or text of the arrangements must be submitted to the FAS Secretary, where an FAS administrative document number will be assigned. Reference to these arrangements (using the FAS administrative document number as a reference) also shall be included in the frequency assignment application as an *M002 note entry in the Circuit Remarks (see Section 9.8.2, paragraph 39k, Annex A).

c. Frequency assignments for purposes other than trunked systems may be authorized on the center frequencies allotted primarily for non-military agencies or AGA, provided the proper selection and coordination procedures have been followed, and provided the priority note P076 is applied to each such assignment.

TABLE 1. Channeling Plan for the 406.1-420 MHz Band - Paired Frequency Channels

Odd Numbered Channels Are 12.5 kHz Only, Even Numbered Channels Are 12.5 kHz or 25 kHz until December 31, 2007, and Only 12.5 kHz After That Date.

Table 1				
Channel	**Center Frequency**	**Center Frequency**	**Center Frequency**	**Center Frequency**
1			406.1125	415.1125
2	406.1250	415.125		
3			406.1375	415.1375
4	406.150	415.150		
5			406.1625	415.1625
6	406.175	415.175		
7			406.1875	415.1875
8	406.200	415.200		
9			406.2125	415.2125
10	406.225	415.225		
11			406.2375	415.2375
12	406.250	415.250		

Table 1				
Channel	**Center Frequency**	**Center Frequency**	**Center Frequency**	**Center Frequency**
13			406.2625	415.2625
14	406.275	415.275		
15			406.2875	415.2875
16	406.300	415.300		
17			406.3125	415.3125
18	406.325	415.325		
19			406.3375	415.3375
20	406.350	415.350		
21			406.3625	415.3625
22	406.375	415.375		
23			406.3875	415.3875
24	406.400	415.400		
25			406.4125	415.4125
26	406.425	415.425		
27			406.4375	415.4375
28	406.450	415.450		
29			406.4625	415.4625
30	406.475	415.475		
31			406.4875	415.4875
32	406.500	415.500		
33			406.5125	415.5125
34	406.525	415.525		
35			406.5375	415.5375
36	406.550	415.550		
37			406.5625	415.5625
38	406.575	415.575		
39			406.5875	415.5875
40	406.600	415.600		
41			406.6125	415.6125
42	406.625	415.625		
43			406.6375	415.6375
44	406.650	415.650		
45			406.6625	415.6625
46	406.675	415.675		
47			406.6875	415.6875
48	406.700	415.700		
49			406.7125	415.7125
50	406.725	415.725		
51			406.7375	415.7375
52	406.750	415.750		

Table 1				
Channel	**Center Frequency**	**Center Frequency**	**Center Frequency**	**Center Frequency**
53			406.7625	415.7625
54	406.775	415.775		
55			406.7875	415.7875
56	406.800	415.800		
57			406.8125	415.8125
58	406.825	415.825		
59			406.8375	415.8375
60	406.850	415.850		
61			406.8625	415.8625
62	406.875	415.875		
63			406.8875	415.8875
64	406.900	415.900		
65			406.9125	415.9125
66	406.925	415.925		
67			406.9375	415.9375
68	406.950	415.950		
69			406.9625	415.9625
70	406.975	415.975		
71			406.9875	415.9875
72	407.000	416.000		
73			407.0125	416.0125
74	407.025	416.025		
75			407.0375	416.0375
76	407.050	416.050		
77			407.0625	416.0625
78	407.075	416.075		
79			407.0875	416.0875
80	407.100	416.100		
81			407.1125	416.1125
82	407.125	416.125		
83			407.1375	416.1375
84	407.150	416.150		
85			407.1625	416.1625
86	407.175	416.175		
87			407.1875	416.1875
88	407.200	416.200		
89			407.2125	416.2125
90	407.225	416.225		
91			407.2375	416.2375
92	407.250	416.250		

Table 1				
Channel	**Center Frequency**	**Center Frequency**	**Center Frequency**	**Center Frequency**
93			407.2625	416.2625
94	407.275	416.275		
95	2.000		407.2875	416.2875
96	407.300	416.300		
97			407.3125	416.3125
98	407.325	416.325		
99			407.3375	416.3375
100	407.350	416.350		
101			407.3625	416.3625
102	407.375	416.375		
103			407.3875	416.3875
104	407.400	416.400		
105			407.4125	416.4125
106	407.425	416.425		
107			407.4375	416.4375
108	407.450	416.450		
109			407.4625	416.4625
110	407.475	416.475		
111			407.4875	416.4875
112	407.500	416.500		
113			407.5125	416.5125
114	407.525	416.525		
115			407.5375	416.5375
116	407.550	416.550		
117			407.5625	416.5625
118	407.575	416.575		
119			407.5875	416.5875
120	407.600	416.600		
121			407.6125	416.6125
122	407.625	416.625		
123			407.6375	416.6375
124	407.650	416.650		
125			407.6625	416.6625
126	407.675	416.675		
127			407.6875	416.6875
128	407.700	416.700		
129			407.7125	416.7125
130	407.725	416.725		
131			407.7375	416.7375
132	407.750	416.750		

Table 1				
Channel	**Center Frequency**	**Center Frequency**	**Center Frequency**	**Center Frequency**
133			407.7625	416.7625
134	407.775	416.775		
135			407.7875	416.7875
136	407.800	416.800		
137			407.8125	416.8125
138	407.825	416.825		
139			407.8375	416.8375
140	407.850	416.850		
141			407.8625	416.8625
142	407.875	416.875		
143			407.8875	416.8875
144	407.900	416.900		
145			407.9125	416.9125
146	407.925	416.925		
147			407.9375	416.9375
148	407.950	416.950		
149			407.9625	416.9625
150	407.975	416.975		
151			407.9875	416.9875
152	408.000	417.000		
153			408.0125	417.0125
154	408.025	417.025		
155			408.0375	417.0375
156	408.050	417.050		
157			408.0625	417.0625
158	408.075	417.075		
159			408.0875	417.0875
160	408.100	417.100		
161			408.1125	417.1125
162	408.125	417.125		
163			408.1375	417.1375
164	408.150	417.150		
165			408.1625	417.1625
166	408.175	417.175		
167			408.1875	417.1875
168	408.200	417.200		
169			408.2125	417.2125
170	408.225	417.225		
171			408.2375	417.2375
172	408.250	417.250		

Table 1				
Channel	**Center Frequency**	**Center Frequency**	**Center Frequency**	**Center Frequency**
173			408.2625	417.2625
174	408.275	417.275		
175			408.2875	417.2875
176	408.300	417.300		
177			408.3125	417.3125
178	408.325	417.325		
179			408.3375	417.3375
180	408.350	417.350		
181			408.3625	417.3625
182	408.375	417.375		
183			408.3875	417.3875
184	408.400	417.400		
185			408.4125	417.4125
186	408.425	417.425		
187			408.4375	417.4375
188	408.450	417.450		
189			408.4625	417.4625
190	408.475	417.475		
191			408.4875	417.4875
192	408.500	417.500		
193			408.5125	417.5125
194	408.525	417.525		
195			408.5375	417.5375
196	408.550	417.550		
197			408.5625	417.5625
198	408.575	417.575		
199			408.5875	417.5875
200	408.600	417.600		
201			408.6125	417.6125
202	408.625	417.625		
203			408.6375	417.6375
204	408.650	417.650		
205			408.6625	417.6625
206	408.675	417.675		
207			408.6875	417.6875
208	408.700	417.700		
209			408.7125	417.7125
210	408.725	417.725		
211			408.7375	417.7375
212	408.750	417.750		

Table 1				
Channel	**Center Frequency**	**Center Frequency**	**Center Frequency**	**Center Frequency**
213			408.7625	417.7625
214	408.775	417.775		
215			408.7875	417.7875
216	408.800	417.800		
217			408.8125	417.8125
218	408.825	417.825		
219			408.8375	417.8375
220	408.850	417.850		
221			408.8625	417.8625
222	408.875	417.875		
223			408.8875	417.8875
224	408.900	417.900		
225			408.9125	417.9125
226	408.925	417.925		
227			408.9375	417.9375
228	408.950	417.950		
229			408.9625	417.9625
230	408.975	417.975		
231			408.9875	417.9875
232	409.000	418.000		
233			409.0125	418.0125
234	409.025	418.025		
235			409.0375	418.0375
236	409.050	418.050		
237			409.0625	418.0625
238	409.075	418.075		
239			409.0875	418.0875
240	409.100	418.100		
241			409.1125	418.1125
242	409.125	418.125		
243			409.1375	418.1375
244	409.150	418.150		
245			409.1625	418.1625
246	409.175	418.175		
247			409.1875	418.1875
248	409.200	418.200		
249			409.2125	418.2125
250	409.225	418.225		
251			409.2375	418.2375
252	409.250	418.250		

Table 1				
Channel	**Center Frequency**	**Center Frequency**	**Center Frequency**	**Center Frequency**
253			409.2625	418.2625
254	409.275	418.275		
255			409.2875	418.2875
256	409.300	418.300		
257			409.3125	418.3125
258	409.325	418.325		
259			409.3375	418.3375
260	409.350	418.350		
261			409.3625	418.3625
262	409.375	418.375		
263			409.3875	418.3875
264	409.400	418.400		
265			409.4125	418.4125
266	409.425	418.425		
267			409.4375	418.4375
268	409.450	418.450		
269			409.4625	418.4625
270	409.475	418.475		
271			409.4875	418.4875
272	409.500	418.500		
273			409.5125	418.5125
274	409.525	418.525		
275			409.5375	418.5375
276	409.550	418.550		
277			409.5625	418.5625
278	409.575	418.575		
279			409.5875	418.5875
280	409.600	418.600		
281			409.6125	418.6125
282	409.625	418.625		
283			409.6375	418.6375
284	409.650	418.650		
285			409.6625	418.6625
286	409.675	418.675		
287			409.6875	418.6875
288	409.700	418.700		
289			409.7125	418.7125
290	409.725	418.725		
291			409.7375	418.7375
292	409.750	418.750		

Table 1				
Channel	**Center Frequency**	**Center Frequency**	**Center Frequency**	**Center Frequency**
293			409.7625	418.7625
294	409.775	418.775		
295			409.7875	418.7875
296	409.800	418.800		
297			409.8125	418.8125
298	409.825	418.825		
299			409.8375	418.8375
300	409.850	418.850		
301			409.8625	418.8625
302	409.875	418.875		
303			409.8875	418.8875
304	409.900	418.900		
305			409.9125	418.9125
306	409.925	418.925		
307			409.9375	418.9375
308	409.950	418.950		
309			409.9625	418.9625
310	409.975	418.975		
311			409.9875	418.9875
312	410.000	419.000		
313			410.0125	419.0125
314	410.025	419.025		
315			410.0375	419.0375
316	410.050	419.050		
317			410.0625	419.0625
318	410.075	419.075		
319			410.0875	419.0875
320	410.100	419.100		
321			410.1125	419.1125
322	410.125	419.125		
323			410.1375	419.1375
324	410.150	419.150		
325			410.1625	419.1625
326	410.175	419.175		
327			410.1875	419.1875
328	410.200	419.200		
329			410.2125	419.2125
330	410.225	419.225		
331			410.2375	419.2375
332	410.250	419.250		

Table 1				
Channel	**Center Frequency**	**Center Frequency**	**Center Frequency**	**Center Frequency**
333			410.2625	419.2625
334	410.275	419.275		
335			410.2875	419.2875
336	410.300	419.300		
337			410.3125	419.3125
338	410.325	419.325		
339			410.3375	419.3375
340	410.350	419.350		
341			410.3625	419.3625
342	410.375	419.375		
343			410.3875	419.3875
344	410.400	419.400		
345			410.4125	419.4125
346	410.425	419.425		
347			410.4375	419.4375
348	410.450	419.450		
349			410.4625	419.4625
350	410.475	419.475		
351			410.4875	419.4875
352	410.500	419.500		
353			410.5125	419.5125
354	410.525	419.525		
355			410.5375	419.5375
356	410.550	419.550		
357			410.5625	419.5625
358	410.575	419.575		
359			410.5875	419.5875
360	410.600	419.600		
361			410.6125	419.6125
362	410.625	419.625		
363			410.6375	419.6375
364	410.650	419.650		
365			410.6625	419.6625
366	410.675	419.675		
367			410.6875	419.6875
368	410.700	419.700		
369			410.7125	419.7125
370	410.725	419.725		
371			410.7375	419.7375
372	410.750	419.750		

Table 1				
Channel	**Center Frequency**	**Center Frequency**	**Center Frequency**	**Center Frequency**
373			410.7625	419.7625
374	410.775	419.775		
375			410.7875	419.7875
376	410.800	419.800		
377			410.8125	419.8125
378	410.825	419.825		
379			410.8375	419.8375
380	410.850	419.850		
381			410.8625	419.8625
382	410.875	419.875		
383			410.8875	419.8875
384	410.900	419.900		
385			410.9125	419.9125
386	410.925	419.925		
387			410.9375	419.9375
388	410.950	419.950		
389			410.9625	419.9625
390	410.975	419.975		
391			410.9875	419.9875

TABLE 2. Channeling Plan for the 406.1-420 MHz Band - Single Frequency Channels

Odd Numbered Channels Are 12.5 kHz Only. Even Numbered Channels Are 12.5 kHz or 25 kHz until December 31, 2007, and Only 12.5 kHz After That Date.

Table 2		
Channel	**Center Frequency**	**Center Frequency**
392	411.000	
393		411.0125
394	411.025	
395		411.0375
396	411.050	
397		411.0625
398	411.075	
399		411.0875
400	411.100	
401		411.1125
402	411.125	
403		411.1375
404	411.150	
405		411.1625

Table 2		
Channel	**Center Frequency**	**Center Frequency**
406	411.175	
407		411.1875
408	411.200	
409		411.2125
410	411.225	
411		411.2375
412	411.250	
413		411.2625
414	411.275	
415		411.2875
416	411.300	
417		411.3125
418	411.325	
419		411.3375
420	411.350	
421		411.3625
422	411.375	
423		411.3875
424	411.400	
425		411.4125
426	411.425	
427		411.4375
428	411.450	
429		411.4625
430	411.475	
431		411.4875
432	411.500	
433		411.5125
434	411.525	
435		411.5375
436	411.550	
437		411.5625
438	411.575	
439		411.5875
440	411.600	
441		411.6125
442	411.625	
443		411.6375
444	411.650	
445		411.6625

Table 2		
Channel	**Center Frequency**	**Center Frequency**
446	411.675	
447		411.6875
448	411.700	
449		411.7125
450	411.725	
451		411.7375
452	411.750	
453		411.7625
454	411.775	
455		411.7875
456	411.800	
457		411.8125
458	411.825	
459		411.8375
460	411.850	
461		411.8625
462	411.875	
463		411.8875
464	411.900	
465		411.9125
466	411.925	
467		411.9375
468	411.950	
469		411.9625
470	411.975	
471		411.9875
472	412.000	
473		412.0125
474	412.025	
475		412.0375
476	412.050	
477		412.0625
478	412.075	
479		412.0875
480	412.100	
481		412.1125
482	412.125	
483		412.1375
484	412.150	
485		412.1625

Table 2		
Channel	**Center Frequency**	**Center Frequency**
486	412.175	
487		412.1875
488	412.200	
489		412.2125
490	412.225	
491		412.2375
492	412.250	
493		412.2625
494	412.275	
495		412.2875
496	412.300	
497		412.3125
498	412.325	
499		412.3375
500	412.350	
501		412.3625
502	412.375	
503		412.3875
504	412.400	
505		412.4125
506	412.425	
507		412.4375
508	412.450	
509		412.4625
510	412.475	
511		412.4875
512	412.500	
513		412.5125
514	412.525	
515		412.5375
516	412.550	
517		412.5625
518	412.575	
519		412.5875
520	412.600	
521		412.6125
522	412.625	
523		412.6375
524	412.650	
525		412.6625

Table 2		
Channel	**Center Frequency**	**Center Frequency**
526	412.675	
527		412.6875
528	412.700	
529		412.7125
530	412.725	
531		412.7375
532	412.750	
533		412.7625
534	412.775	
535		412.7875
536	412.800	
537		412.8125
538	412.825	
539		412.8375
540	412.850	
541		412.8625
542	412.875	
543		412.8875
544	412.900	
545		412.9125
546	412.925	
547		412.9375
548	412.950	
549		412.9625
550	412.975	
551		412.9875
552	413.000	
553		413.0125
554	413.025	
555		413.0375
556	413.050	
557		413.0625
558	413.075	
559		413.0875
560	413.100	
561		413.1125
562	413.125	
563		413.1375
564	413.150	
565		413.1625

Table 2		
Channel	**Center Frequency**	**Center Frequency**
566	413.175	
567		413.1875
568	413.200	
569		413.2125
570	413.225	
571		413.2375
572	413.250	
573		413.2625
574	413.275	
575		413.2875
576	413.300	
577		413.3125
578	413.325	
579		413.3375
580	413.350	
581		413.3625
582	413.375	
583		413.3875
584	413.400	
585		413.4125
586	413.425	
587		413.4375
588	413.450	
589		413.4625
590	413.475	
591		413.4875
592	413.500	
593		413.5125
594	413.525	
595		413.5375
596	413.550	
597		413.5625
598	413.575	
599		413.5875
600	413.600	
601		413.6125
602	413.625	
603		413.6375
604	413.650	
605		413.6625

Table 2		
Channel	**Center Frequency**	**Center Frequency**
606	413.675	
607		413.6875
608	413.700	
609		413.7125
610	413.725	
611		413.7375
612	413.750	
613		413.7625
614	413.775	
615		413.7875
616	413.800	
617		413.8125
618	413.825	
619		413.8375
620	413.850	
621		413.8625
622	413.875	
623		413.8875
624	413.900	
625		413.9125
626	413.925	
627		413.9375
628	413.950	
629		413.9625
630	413.975	
631		413.9875
632	414.000	
633		414.0125
634	414.025	
635		414.0375
636	414.050	
637		414.0625
638	414.075	
639		414.0875
640	414.100	
641		414.1125
642	414.125	
643		414.1375
644	414.150	
645		414.1625

Table 2		
Channel	**Center Frequency**	**Center Frequency**
646	414.175	
647		414.1875
648	414.200	
649		414.2125
650	414.225	
651		414.2375
652	414.250	
653		414.2625
654	414.275	
655		414.2875
656	414.300	
657		414.3125
658	414.325	
659		414.3375
660	414.350	
661		414.3625
662	414.375	
663		414.3875
664	414.400	
665		414.4125
666	414.425	
667		414.4375
668	414.450	
669		414.4625
670	414.475	
671		414.4875
672	414.500	
673		414.5125
674	414.525	
675		414.5375
676	414.550	
677		414.5625
678	414.575	
679		414.5875
680	414.600	
681		414.6125
682	414.625	
683		414.6375
684	414.650	
685		414.6625

Table 2		
Channel	**Center Frequency**	**Center Frequency**
686	414.675	
687		414.6875
688	414.700	
689		414.7125
690	414.725	
691		414.7375
692	414.750	
693		414.7625
694	414.775	
695		414.7875
696	414.800	
697		414.8125
698	414.825	
699		414.8375
700	414.850	
701		414.8625
702	414.875	
703		414.8875
704	414.900	
705		414.9125
706	414.925	
707		414.9375
708	414.950	
709		414.9625
710	414.975	
711		414.9875
712	415.000	
713		415.0125
714	415.025	
715		415.0375
716	415.050	
717		415.0625
718	415.075	
719		415.0875
720	415.100	

4.3.10 Channeling Plan for Splinter Channel Assignments in the Band 406.1-420 MHz

(This plan is effective for all existing systems and assignments until December 31, 2007, after which date all systems authorized under this Section shall have transitioned to the channeling plan given in Section 4.3.9 of this Manual, and all assignments authorized under this Section shall expire.)

The frequencies shown in this plan are available for assignment to all Government agencies in accordance with allocation footnote G5 and as specified in this Section.

M406.265625[1]	M408.490625[1]	M409.865625[1]	M416.790625[1]	M419.990625[1]
.268750[2]	.493750[2]	.868750[2]	.793750[2]	.993750[2]
.271875[1]	.496875[1]	.871875[1]	.796875[1]	.996875[1]
.278125[1]	.503125[1]	.878125[1]	.803125[1]	
.281250[2]	.506250[2]	.881250[2]	.806250[2]	
.284375[1]	.509375[1]	.884375[1]	.809375[1]	
	.965625[1]			
	.968750[2]			
	.971875[1]			
	.978125[1]			
	.981250[2]			
	.984375[1]			

1 This frequency is available for operations requiring up to 5 kHz authorized bandwidth.
2. This frequency is available for operations requiring an authorized bandwidth between 5 and 10 kHz, inclusive.

CONDITIONS FOR USE

1. The technical standards applicable to the use of above splinter channels are shown in Section 5.3.6.
2. Directional antennas shall be used on point-to-point circuits.
3. Prior to filing an application for a splinter channel, coordination shall be effected with existing splinter channel users in the same geographical area utilizing assigned frequencies spaced within" 18.750 kHz from the requested frequency.
4. The above splinter channels were derived by splitting the upper and lower 122 kHz sidebands of a standard 25 kHz channel into four segments each with 63 kHz bandwidth. Within the same geographical area, each 122 kHz sideband may be optionally assigned either for one splinter channel with a necessary bandwidth between 5 to 10 kHz inclusive, or for two splinter channels requiring up to 5 kHz necessary bandwidth.

4.3.11 Plan for Bio-Medical Telemetry and Medical Radiocommunication

BIO-MEDICAL TELEMETRY ONLY

38 - 41 MHz	See Annex K
174 - 216 MHz	See Annex K
460.650 - 460.875 MHz	See US209 in Section 4.1.3
465.650 - 465.875 MHz	See US209 in Section 4.1.3

MEDICAL RADIOCOMMUNICATION

The following frequencies may be authorized for the purpose of conducting radio operations for the delivery or rendition of medical services to individuals, subject to the indicated limitations.

Frequency (MHz)	Class of Station(s)	Limitation
150.775	Mobile only	1
150.790	Mobile only	1
152.0075	Base	2
163.250	Base	2
462.950	Base and Mobile	3,5
462.975	Base and Mobile	3,5
463.000	Base and Mobile	3,4,6,7
463.025	Base and Mobile	3,4,6,7
463.050	Base and Mobile	3,4,6,7
463.075	Base and Mobile	3,4,7,8
463.100	Base and Mobile	3,4,7,8
463.125	Base and Mobile	3,4,7,8
463.150	Base and Mobile	3,4,7,8
463.175	Base and Mobile	3,4,7,8
467.950	Mobile Only	3,5,9
467.975	Mobile Only	3,5,9
468.000	Mobile Only	3,4,6,7,9
468.025	Mobile Only	3,4,6,7,9
468.050	Mobile Only	3,4,6,7,9
468.075	Mobile Only	3,4,6,7,9
468.100	Mobile Only	3,4,6,7,9
468.125	Mobile Only	3,4,6,7,9
468.150	Mobile Only	3,4,6,7,9
468.175	Mobile Only	3,4,6,7,9

1. This frequency may be authorized only for voice transmission from a portable (hand-held) unit, that is not airborne, to an ambulance or other emergency vehicle for automatic retransmission (mobile-repeater) on a regular mobile frequency to a base station facility. Operation on this frequency is limited to 2.5 Watts output power.

2. This frequency may be authorized only for one-way paging communications to mobile receivers. Transmissions for the purpose of activating or controlling remote objects on this frequency will not be authorized.

3. For two-frequency systems, separation between base and mobile transmit frequencies is 5 MHz.

4. For applications for new radio systems received after August 15, 1974, the eight frequency pairs listed below will be assigned in a block for shared operations subject to the following:

a. For uniformity in usage, these frequency pairs may be referred to by channel name, as follows:

Base and Mobile MHz	Mobile Only MHz	Channel Name
463.000	468.000	MED-ONE
463.025	468.025	MED-TWO
463.050	468.050	MED-THREE
463.075	468.075	MED-FOUR
463.100	468.100	MED-FIVE
463.125	468.125	MED-SIX

463.150	468.150	MED-SEVEN
463.175	468.175	MED-EIGHT

b. Except as provided in subparagraphs e. and f. of this paragraph, mobile or portable stations must employ equipment which is both wired and equipped to transmit/receive, respectively, on each of these eight frequency pairs.

c. Except as provided in subparagraph f. of this paragraph, base and fixed stations[11] must employ equipment which is both wired and equipped to transmit/receive, respectively, on at least four (three, if bio-medical telemetry operation is not employed in the system) of these eight frequency pairs.

d. Multi-channel equipment requirements for use of these frequency pairs are intended to afford capability for alternating use of the individual frequencies, and ability to conduct simultaneous operations is not required. These requirements may be met in a single equipment unit or in any combination of equipment units suitable to the applicant's operations.

e. Portable (hand-held) units operated with a maximum output power of 2.5 watts are exempted from the multi-channel equipment requirements specified in subparagraph c. of this paragraph.

f. Stations located in the Canadian coordination zone (see Part 3.4), will be required to meet multi-channel equipment requirements only for those frequencies up to the number specified in subparagraphs b. and c. of this paragraph which have been assigned to the licensee after coordination with Canada in accordance with the applicable US-Canada agreement.

5. This frequency may be authorized for the dispatch of medical-care vehicles and personnel for the rendition or delivery of medical services. Central-dispatch operations serving multisystem requirements in an area-wide medical radio communications plan may be authorized and may include the designation of this frequency for intra-system and inter-system mutual assistance purposes.

6. This frequency may be authorized on a primary basis for operations in bio-medical telemetry systems. F1D, F2D, and F3E emissions may be authorized. On a secondary basis, subject to noninterference to bio-medical telemetry systems, this frequency may be authorized for the transmission of messages related to the efficient administration of organizations and facilities engaged in medical services operations.

7. The continuous carrier mode of operation may be authorized for use of telemetry emission on this frequency.

8. This frequency may be authorized on a primary basis for communications, between medical facilities, vehicles, and personnel, related to medical supervision and instruction for treatment and transport of patients in the rendition or delivery of medical services. F2D and F3E emissions may be authorized. On a secondary basis, subject to noninterference to the foregoing types of operations, this frequency may be authorized for the transmission of messages related to the efficient administration of organizations and facilities engaged in medical services operations and for bio-medical telemetry transmissions, including the use of F1D emission.

9. This frequency may be assigned to a fixed station for the control of a base station repeater (FBR) if it is also assigned to the associated mobile station. Fixed stations operating on this frequency shall comply with the following requirements if they are located within 120 kilometers of the center of urbanized areas of 200,000 or more population.

a. If the station is used to control one or more base station repeaters located within 45 degrees of azimuth, a directional antenna having a front-to-back ratio of at least 15 dB shall be used at the fixed station. For other situations, where a directional antenna cannot be used, a cardioid, bi-directional or omni-directional antenna may be employed. In each case, the antenna used must, consistent with reasonable design, produce a radiation pattern that provides only the coverage necessary to permit satisfactory control of each base station repeater and limit radiation in other directions to the extent feasible.

11. As indicated in Limitation 9, Section 4.3.11, transmissions by fixed stations are limited to the control of base station repeaters.

b. The strength of the signal of a fixed station, controlling a single base station repeater, may not exceed by more than 6 dB, at the antenna terminal of the base station repeater receiver, the signal strength produced there by a unit of the associated mobile station. When the station controls more than one base station repeater, the 6 dB control-to-mobile signal difference need be verified at only one of the base station repeater sites. The measurement of the signal strength of the mobile unit must be made when such unit is transmitting from the fixed station location or, if that is not practical, from a location within 400 meters of the fixed station site.

c. Each application for a fixed station to be authorized under the provisions of this paragraph shall be accompanied by a statement certifying that the output power of the proposed station transmitter will be adjusted to comply with the foregoing signal level limitation. Records of the measurements used to determine the signal ratio shall be kept with the station records and shall be made available for inspection upon request.

d. Urbanized areas of 200,000 or more population are defined in the U.S. Census Population, 1960, Vol. 1, Table 23, Page 50. The centers of urbanized areas are determined from the Appendix, page 226, of the U.S. Commerce publication "Air Line Distance Between Cities in the United States."

4.3.12 Channeling Plan for Assignments in the Fixed Service in the 14500.0 to 14714.5 and 15136.5 to 15350.0 MHz

1. The following channeling plan became effective on January 1, 1982, for all assignments in the Fixed Service.

2. Existing assignments as of January 1, 1982 in the Fixed Service which are in the bands 14500.0 to 14714.5 MHz and 15136.5 to 15350.0 MHz that are not in compliance with the channeling plan may be retained until January 1, 1997. However, if existing equipment is replaced prior to January 1, 1997, assignments for the replaced equipment must be in accordance with the channeling plan.

3. This channeling plan is only applicable to assignments in the Fixed Service in the bands 14500.0 to 14714.5 and 15136.5 to 15350.0 MHz. The assigned frequency shall be chosen such that the frequency "2 of its necessary bandwidth shall not extend beyond the upper or lower limits of bands indicated herein. A general breakdown of these bands is:

a. For emission bandwidths equal to or greater than 3.5 MHz:
14500.0 to 14710.0 MHz
15140.0 to 15350.0 MHz

b. For emission bandwidths less than 3.5 MHz:
14710.0 to 14714.5 MHz
15136.5 to 15140.0 MHz

4. Criteria for assignments in the Fixed Service with emission bandwidths equal to or greater than 3.5 MHz:

a. The assigned frequency must center on one of the frequencies given in Table 1.

b. Multiple contiguous channels are to be used for emission bandwidths of 3.5 MHz or greater.

c. In order to promote uniformity and to establish a natural guard band, it is strongly urged that frequencies be selected in pairs from the bands 14500.0 to 14710.0 and 15140.0 to 15350.0 on an equal basis.

5. Criteria for assignments in the Fixed Service with emission bandwidth of less than 3.5 MHz:

a. Assignments in the Fixed Service with emission bandwidths of less than 3.5 MHz are restricted to the bands:
14710.0 to 14714.5 MHz
and
15136.5 to 15140.0 MHz

b. Narrowband assignments, those with less than 3.5 MHz of necessary bandwidth, shall not be

made in the bands 14500.0 to 14710.0 and 15140.0 to 15350.0 MHz.

Table 1. Center Frequencies (MHz) of 2.5 MHz Channels in the Bands 14500.0-14714.5 MHz and 15136.5-15350.0 MHz	
14500.0-14714.5 MHz	15136.5-15350.0 MHz
*14501.25	*15141.25
14503.75	15143.75
14506.25	15146.25
14508.75	15148.75
14511.25	15151.25
14513.75	15153.75
14516.25	15156.25
14518.75	15158.75
14521.25	15161.25
14523.75	15163.75
14526.25	15166.25
14528.75	15168.75
14531.25	15171.25
14533.75	15173.75
14536.25	15176.25
14538.75	15178.75
14541.25	15181.25
14543.75	15183.75
14546.25	15186.25
14548.75	15188.75
14551.25	15191.25
14553.75	15193.75
14556.25	15196.25
14558.75	15198.75
14561.25	15201.25
14563.75	15203.75
14566.25	15206.25
14568.75	15208.75
14571.25	15211.25
14573.75	15213.75
14576.25	15216.25
14578.75	15218.75
14581.25	15221.25
14583.75	15223.75
14586.25	15226.25
14588.75	15228.75
14591.25	15231.25
14593.75	15233.75
14596.25	15236.25

14598.75	15238.75
14601.25	15241.25
14603.75	15243.75
14606.25	15246.25
14608.75	15248.75
14611.25	15251.25
14613.75	15253.75
14616.25	15256.25
14618.75	15258.75
14621.25	15261.25
14623.75	15263.75
14626.25	15266.25
14628.75	15268.75
14631.25	15271.25
14633.75	15273.75
14636.25	15276.25
14638.75	15278.75
14641.25	15281.25
14643.75	15283.75
14646.25	15286.25
14648.75	15288.75
14651.25	15291.25
14653.75	15293.75
14656.25	15296.25
14658.75	15298.75
14661.25	15301.25
14663.75	15303.75
14666.25	15306.25
14668.75	15308.75
14671.25	15311.25
14673.75	15313.75
14676.25	15316.25
14678.75	15318.75
14681.25	15321.25
14683.75	15323.75
14686.25	15326.25
14688.75	15328.75
14691.25	15331.25
14693.75	15333.75
14696.25	15336.25
14698.75	15338.75
14701.25	15341.25
14703.75	15343.75

14706.25	15346.25
*14708.75	*15348.75
* These channels cannot be used for bandwidths greater than 2.5 MHz. Total number of channels available--168.	

4.3.13 Channeling Plan for Assignments in the Maritime Mobile Service in the Bands 4000-4063 and 8100-8195 kHz

1. For the band 4000-4063 kHz:

a. Frequency assignments for ship stations in the band 4000-4063 kHz must conform to the channeling plan shown below in accordance with Appendix **17** Part B Section I, Sub-Section C-1, of the International Radio Regulations.

b. Frequencies may be used by ship stations:

- or supplementing ship-to-shore channels for duplex operation with coast station channels listed in Table 1 of Annex H;
- for intership simplex (single-frequency) operation;
- for duplex operation with coast stations working in the band 4438-4650 kHz;
- for duplex operation with Channel Nos. 428 and 429 of Table 1, Annex H.

Table. Recommended Single-Sideband Transmitting Frequencies (in kHz) for Ship Stations in the Band 4000-4063 kHz

Channel N0.	Carrier Frequency	Assigned Frequency
1	4000	4001.4
2	4003	4004.4
3	4006	4007.4
4	4009	4010.4
5	4012	4013.4
6	4015	4016.4
7	4018	4019.4
8	4021	4022.4
9	4024	4025.4
10	4027	4028.4
11	4030	4031.4
12	4033	4034.4
13	4036	4037.4
14	4039	4040.4
15	4042	4043.4
16	4045	4046.4
17	4048	4049.4
18	4051	4052.4
19	4054	4055.4
20	4057	4058.4
21	4060	4061.4*
* Effective 1 July 1991, in the maritime mobile service, this frequency is available exclusively for non-government use.		

2. For the band 8100-8195 kHz:

a. Frequency assignments for maritime mobile stations in the band 8100-8195 kHz must conform to the channeling plan show below in accordance with Appendix 17 Part B Section I, Sub-Section C-2, of the International Radio Regulations.

b. Frequencies may be used by maritime mobile stations:

- for supplementing ship-to-shore channels for duplex operation with coast station channels listed in Table 1 of Annex H;
- for intership simplex (single-frequency) operations;
- for ship-to-shore or shore-to-ship simplex operations;
- for duplex operation with Channel Nos. 834, 835, 836 and 837 of Table 1, Annex H.

Table. Recommended Single-Sideband Transmitting Frequencies (in kHz) for Ship and Coast Stations in the Band 8100-8195 kHz

Channel N0.	Carrier Frequency	Assigned Frequency
1	8101	8102.4
2	8104	8105.4
3	8107	8108.4
4	8110	8111.4
5	8113	8114.4*
6	8116	8117.4
7	8119	8120.4
8	8122	8123.4
9	8125	8126.4
10	8128	8129.4*
11	8131	8132.4
12	8134	8135.4
13	8137	8138.4
14	8140	8141.4
15	8143	8144.4
16	8146	8147.4
17	8149	8150.4
18	8152	8153.4
19	8155	8156.4
20	8158	8159.4
21	8161	8162.4
22	8164	8165.4
23	8167	8168.4
24	8170	8171.4
25	8173	8174.4
26	8176	8177.4
27	8179	8180.4
28	8182	8183.4
29	8185	8186.4
30	8188	8189.4
31	8191	8192.4

* Effective 1 July 1991, in the maritime mobile service, this frequency is available exclusively for non-government use.

4.3.14 Channeling Plan for Assignments in the Fixed Service in the Bands 932.4-935 MHz and 941.4-944 MHz

This plan is a guide for identifying the center frequencies of those paired frequencies that normally are used for assignments with a necessary bandwidth that can be accommodated within 12.5, 25, 50, 100 and 200 kHz. Transportable Operations are not permitted in the point-to-point bands 932.5-935.0 and 941.5-944.0 MHz. To permit flexibility, applicants for either point-to-point or point-to-multipoint channels will be permitted to combine channels upon a showing that there is a need and sufficient frequencies are available to permit this. Applicants may split channels if they choose to do so. The frequencies listed in this plan are shared with non-Government users, and applications for assignment from Government users are subject to coordination with non-government users prior to NTIA approval.

CONDITIONS AND LIMITATIONS

1. Point-to-Multipoint Assignments:

Table 1 contains a list of five pairs of frequencies that are designated for use only in fixed point-to-multipoint assignments operating with a necessary bandwidth of 12.5 kHz or less.

a. For paired frequency operations the 941.4-941.5 MHz frequencies will be used to transmit to the multipoint receiving stations, and the 932.4-932.5 MHz frequencies will be used for reverse link communications.

b. Unpaired, single frequency, one-way point-to-multipoint operations are permitted, using either of the paired frequencies. However, when the multipoint receiving stations are located less than 48 kilometers (30 miles) from the transmitting station, frequencies from the 932-932.5 MHz band must be used.

c. Point-to-point use of the 932.4-932.5 MHz frequencies will be permitted but only when the transmission is relayed by a station transmitting in the 941.4-941.5 MHz band.

d. Frequencies will be used so as to facilitate communications on an interference-free basis in each operational/service area. In order to facilitate maximum reuse of frequencies, stations separated by 113 kilometers (70 miles) or more, and operating on the same frequency (co-channel), will be considered as interference free (see also Section 8.2.16). However, at distances of less than 113 km, reuse of a frequency (co-channel) will be permitted only upon providing evidence that the operation will not cause harmful interference to existing users.

e. Equivalent power and antenna-height restrictions:

Antenna Height in Meters	Maximum Effective Radiated Power	
	In Watts	In dBm
152.5 and below	1,000	60
Above 152.5 up to 182	630	58
Above 182 up to 213	500	57
Above 213 up to 244	400	56
Above 244 up to 274	315	55
Above 274 up to 305	250	54
Above 305	200	53

2. Point-to-Point Assignments:

Table 2 contains a list of thirty pairs of frequencies that are designated for two-way use in fixed point-to-point operations with a necessary bandwidth of 200 kHz or less. Frequencies shall be selected in pairs. However, unpaired frequency use, or single frequency one-way use, will be permitted, but only upon showing that spectrum is not available in other bands and that paired use will not be adversely affected.

EXCEPTIONS

Exceptions to the above conditions and limitations will be considered by the FAS on a case-by-case basis.

TABLE 1. Paired Frequencies for Point-to-Multipoint Assignments (12.5 kHz Bandwidth)	
MHz	MHz
932.44375	941.44375
932.45625	941.45625
932.46875	941.46875
932.48125	941.48125
932.49375	941.49375

TABLE 2. Paired Frequencies for Point-to-Point Assignments 25 kHz Bandwidth Pairs	
MHz	MHz
932.5125	941.5125
932.5375	941.5375
932.5625	941.5625
932.5875	941.5875
932.6125	941.6125
932.6375	941.6375
932.6625	941.6625
934.8375	943.8375
934.8625	943.8625
934.8875	943.8875
934.9125	943.9125
934.9375	943.9375
934.9625	943.9625
934.9875	943.9875

50 kHz Bandwidth Pairs		**100 kHz Bandwidth Pairs**		**200 kHz Bandwidth Pairs**	
MHz	**MHz**	**MHz**	**MHz**	**MHz**	**MHz**
932.7000	941.7000	932.8250	941.8250	933.1750	942.1750
932.7500	941.7500	932.9250	941.9250	933.3750	942.3750
934.8000	943.8000	933.0250	942.0250	933.5750	942.5750
		934.5250	943.5250	933.7750	942.7750
		934.6250	943.6250	933.9750	942.9750
		934.7250	943.7250	934.1750	943.1750
				934.3750	943.3750

4.3.15 Channeling Plan for Land Mobile Assignments in the Band 220-222 MHz

The following channeling plan is composed of 200 frequency pairs for shared Government/non-Government land-mobile operations with necessary bandwidths less than or equal to 4 kHz. Of these 200 channel pairs, 60 pairs are for nationwide use and 140 pairs are for shared local use. Of the 60 nationwide channel pairs, 10 are for exclusive Government use and 50 are for exclusive non-Government use. Of the 140 shared local-use channel pairs, 100 are available for trunked operations or other operations of equivalent or greater efficiency, 20 are set aside for data only operations until March 31, 2000, 10 are available for public safety/mutual aid, and the remaining 10 channel pairs have no restrictions on use.

The following table indicates the channel designations of frequencies (channel number, base station frequency and function) available for assignment under the following conditions:

1) Frequencies shall be assigned in pairs, with base station frequencies taken from the 220-221 MHz band, corresponding mobile frequencies being 1 MHz higher, taken from the 221-222 MHz band.

2) Only the lower half of the frequency pairs is listed in the table.

TABLE OF 220-222 MHz CHANNEL DESIGNATIONS

(Channel Number, Base Frequency in MHz and Function)

Trunked Systems (See next paragraph for Trunked Channel Groups)			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
1	220.0025	11	.0525
2	.0075	12	.0575
3	.0125	13	.0625
4	.0175	14	.0675
5	.0225	15	.0725
6	.0275	16	.0775
7	.0325	17	.0825
8	.0375	18	.0875
9	.0425	19	.0925
10	.0475	20	.0975

Non-Government Nationwide System			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
21	220.1025	26	.1275
22	.1075	27	.1325
23	.1125	28	.1375
24	.1175	29	.1425
25	.1225	30	.1475

Trunked Systems (See next paragraph for Trunked Channel Groups)			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
31	220.1525	41	.2025

Trunked Systems (See next paragraph for Trunked Channel Groups)			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
32	.1575	42	.2075
33	.1625	43	.2125
34	.1675	44	.2175
35	.1725	45	.2225
36	.1775	46	.2275
37	.1825	47	.2325
38	.1875	48	.2375
39	.1925	49	.2425
40	.1975	50	.2475

Non-Government Nationwide Systems			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
51	220.2525	56	.2775
52	.2575	57	.2825
53	.2625	58	.2875
54	.2675	59	.2925
55	.2725	60	.2975

Trunked Systems			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
61	220.3025	71	.3525
62	.3075	72	.3575
63	.3125	75	.3625
64	.3175	74	.3675
65	.3225	75	.3725
66	.3275	76	.3775
67	.3325	77	.3825
68	.3375	78	.3875
69	.3425	79	.3925
70	.3475	80	.3975

Non-Government Nationwide Systems			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
81	220.4025	86	.4275
82	.4075	87	.4325
83	.4125	88	.4375

84	.4175	89	.4425
85	.4225	90	.4475

Trunked Systems			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
91	220.4525	101	.5025
92	.4575	102	.5075
93	.4625	103	.5125
94	.4675	104	.5175
95	.4725	105	.5225
96	.4775	106	.5275
97	.4825	107	.5325
98	.4875	108	.5375
99	.4925	109	.5425
100	.4975	110	.5475

Government Nationwide Systems			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
111	220.5525	116	220.5775
112	.5575	117	.5825
113	.5625	118	.5875
114	.5675	119	.5925
115	.5725	120	.5975

Trunked Systems			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
121	220.6025	131	220.6525
122	.6075	132	.6575
123	.6125	133	.6625
124	.6175	134	.6675
125	.6225	135	.6725
126	.6275	136	.6775
127	.6325	137	.6825
128	.6375	138	.6875
129	.6425	139	.6925
130	.6475	140	.6975

Non-Government Nationwide Systems			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
141	220.7025	151	.7525
142	.7075	152	.7575
143	.7125	153	.7625
144	.7175	154	.7675
145	.7225	155	.7725
146	.7275	156	.7775
147	.7325	157	.7825
148	.7375	158	.7875
149	.7425	159	.7925
150	.7475	160	.7975

Public Safety/Mutual Air Operations			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
161	220.8025	166	220.8275
162	.8075	167	.8325
163	.8125	168	.8375
164	.8175	169	.8425
165	.8225	170	.8475

Available for any use			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
171	220.8525	176	220.8775
172	.8575	177	.8825
173	.8625	178	.8875
174	.8675	179	.8925
175	.8725	180	.8975

Data Operations See Note *			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
181	220.9025	191	220.9525
182	.9075	192	.9575
183	.9125	193	.9625
184	.9175	194	.9675
185	.9225	195	.9725
186	.9275	196	.9775
187	.9325	197	.9825

Data Operations See Note *			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
188	.9375	198	.9875
189	.9425	199	.9925
190	.9475	200	.9975

Note: Channels 181-185 and 196-200 are indefinitely reserved until further FCC action and are not currently available for assignment or use.

Trunked Channel Groups

The channel groups listed in the following Table are available to both Government and non-Government applicants for trunked operations.

Table - Trunked Channel Groups			
Group #	**Channel #**	**Group #**	**Channel #**
1	1-31-61-91-121	11	11-41-71-101-131
2	2-32-62-92-122	12	12-42-72-102-132
3	3-33-63-93-123	14	14-44-74-104-134
4	4-34-64-94-124	15	15-45-75-105-135
5	5-35-65-95-125	16	16-46-76-106-136
6	6-36-66-96-126	11	11-41-71-101-131
7	7-37-67-97-127	17	17-47-77-107-137
8	8-38-68-98-128	18	18-48-78-108-138
9	9-39-69-99-129	19	19-49-79-109-139
10	10-40-70-100-130	20	20-50-80-110-140

4.3.16 Plans for Interagency Law Enforcement and Incident Response Operations in the Bands 162-174 MHz and 406.1-420 MHz

CONDITIONS FOR USE

1. The frequencies shown in this plan are available for assignment to all Government agencies to satisfy intermittent law enforcement and public safety incident response requirements. Non-Government agencies may use these frequencies only in cooperation with agencies of the Federal Government. Federal agencies will provide written certification to non-Government agencies indicating that the non-Government operation is necessary. Non-Government entities will be advised in the written certification that under Federal law they are required to obtain a license from the Federal Communications Commission (FCC) for such operations, and that the FCC File Number for the license, once obtained, will be provided to the Government agency providing the written certification. A copy of this certification will also be submitted to the NTIA Public Safety Program Office. Federal agencies shall comply with the requirements of Section 2.3.12 of this Manual. The frequencies are available on a shared basis and will not be authorized for the exclusive use of any one agency.

2. All Government operations shall be authorized in accordance with Chapter 9 of this Manual. The FCC will submit all non-Government applications to the Frequency Assignment Subcommittee (FAS) for approval.

3. Base stations are authorized use of the mobile transmit frequencies for access to fixed stations,

e.g., repeaters. Mobile stations are permitted to use fixed station transmit frequencies for talk-around communications.

4. The following restrictions apply:
   (a) the minimum ERP necessary to support the intended use shall be employed;
   (b) the maximum base or mobile transmitter output power shall not exceed 125 Watts; and
   (c) the gain of the base station antenna shall not exceed 6 dBi.
5. Exceptions to the above restrictions will be considered by the FAS on a case-by-case basis.

LAW ENFORCEMENT PLANS

1. Frequencies 167.0875 MHz and 414.0375 MHz are designated as National Calling Channels for initial contact and will be identified in the radio as indicated in paragraph 2 below. Initial contact communications will be established using analog FM emission (11KF3E). The agency in control of the incident will assign specific operational channels as required for incident support operations.

2. The interoperability frequencies will be identified in mobile and portable radios as follows with Continuous Tone-Controlled Squelch Systems (CTCSS) frequency 167.9 Hz and/or Network Access Code (NAC) $68F:

VHF PLAN			UHF PLAN		
Identifier	**Mobile Transmit (MHz)**	**Mobile Receive (MHz)**	**Identifier**	**Mobile Transmit (MHz)**	**Mobile Receive (MHz)**
LE A	167.0875 (Simplex)	167.0875	LE B	414.0375 (Simplex)	414.0375
LE 1	162.0875	167.0875	LE 10	418.9875	409.9875
LE 2	162.2625	167.2500	LE 11	419.1875	410.1875
LE 3	162.8375	167.7500	LE 12	419.6125	410.6125
LE 4	163.2875	168.1125	LE 13	414.0625 (Simplex)	414.0625
LE 5	163.4250	168.4625	LE 14	414.3125 (Simplex)	414.3125
LE 6	167.2500 (Simplex)	167.2500	LE 15	414.3375 (Simplex)	414.3375
LE 7	167.7500 (Simplex)	167.7500	LE 16	409.9875 (Simplex)	409.9875
LE 8	168.1125 (Simplex)	168.1125	LE 17	410.1875 (Simplex)	410.1875
LE 9	168.4625 (Simplex)	168.4625	LE 18	410.6125 (Simplex)	410.6125

3. All applications using these allotted frequencies shall be affixed with Record Note S397. This assignment is for a joint law enforcement requirement pursuant to Section 4.3.16 of this Manual.

INCIDENT RESPONSE PLANS

1. Frequencies 169.5375 MHz, paired with 164.7125 MHz, and 410.2375 MHz, paired with 419.2375 MHz, are designated as the calling channels for initial contact and will be identified in the radio as indicated in paragraph 2. Initial contact will be established using analog FM emission (11KF3E). CTCSS will not be used on the calling channels to ensure access by stations from outside the normal area of operation. The agency in control of the incident will assign specific operational channels as required for incident support operations.

2. The Interoperability frequencies will be identified in mobile and portable radios as follows:

VHF PLAN				UHF			
Identifier	**Mobile Transmit (MHz)**	**Mobile Receive (MHz)**	**CTCSS**	**Identifier**	**Mobile Transmit (MHz)**	**Mobile Receive (MHz)**	**CTCSS**
NC 1 Calling	164.7125	169.5375	None	NC 2 Calling	419.2375	410.2375	None
IR 1	165.2500	170.0125	As required	IR 10	419.4375	410.4375	As required
IR 2	165.9625	170.4125	As required	IR 11	419.6375	410.6375	As required
IR 3	166.5750	170.6875	As required	IR 12	419.8375	410.8375	As required
IR 4	167.3250	173.0375	As required	IR 13	413.1875 (Simplex)	413.1875	As required
IR 5	169.5375 (Simplex)	169.5375	As required	IR 14	413.2125 (Simplex)	413.2125	As required
IR 6	170.0125 (Simplex)	170.0125	As required	IR 15	410.2375 (Simplex)	410.2375	As required
IR 7	170.4125 (Simplex)	170.4125	As required	IR 16	410.4375 (Simplex)	410.4375	As required
IR 8	170.6875 (Simplex)	170.6875	As required	IR 17	410.6375 (Simplex)	410.6375	As required
IR 9	173.0375 (Simplex)	173.0375	As required	IR 18	410.8375 (Simplex)	410.8375	As required

3. All applications using these allotted frequencies shall be affixed with Record Note S398. This assignment is for a joint incident response requirement pursuant to Section 4.3.16 of this Manual.

4.3.17 Plan for JTIDS TDMA Waveform Systems

The Joint Tactical Information Distribution System/Multifunctional Information Distribution System (JTIDS/MIDS) Time Division Multiple Access (TDMA) Waveform is the designation for the tactical data link system used by the military services, which is critical to the "Command and Control" infrastructure of the Department of Defense (DOD). This waveform designation applies to the JTIDS family of terminals (Class 1, Class 2, Class 2M and Class 2H); MIDS Low Volume Terminal (LVT) variants (LVT-1, LVT-2, LVT-3/Fighter Data Link); and future approved systems incorporating the JTIDS/MIDS TDMA Waveform implementation. These TDMA systems provide the DOD with totally Integrated Communications, Navigation and Identification (ICNI) capabilities. The DOD refers to these terminals collectively as "Link 16".

JTIDS/MIDS TDMA Waveform operation is authorized in the 960-1215 MHz band and in addition, the DOD and the Department of Transportation (DOT) have made agreements to assure spectrum access and to maintain mutual compatibility between Air Traffic Control (ATC) systems and JTIDS/MIDS TDMA Waveform systems within the United States and its possessions (US&P). The following paragraphs are consistent with DOD - DOT agreements:

1. Uncoordinated JTIDS/MIDS TDMA Waveform operations are authorized in the 960-1215 MHz band in accordance with the coordinations outlined in Authorizing NTIA Spectrum Certification Document(s).

2. The DOD shall incorporate engineering features in the JTIDS/MIDS TDMA Waveform equipment in accordance with the NTIA guidance and requirements for JTIDS/MIDS EMC features. The engineering features when implemented shall minimize the possibility for harmful interference between ATC

and JTIDS/MIDS TDMA Waveform systems operating in the US&P.

3. The DOT will support US&P frequency assignments for JTIDS/MIDS TDMA Waveform operations, with the conditions identified in the authorizing NTIA Spectrum Certification Documents and as set forth herein.

4. The DOD will ensure that by 2020, all JTIDS/MIDS TDMA Waveform Terminals are capable of remapping frequencies. Any JTIDS/MIDS TDMA Waveform Terminal produced after July 1, 2007 will be capable of remapping and the capability will be added to all terminals produced prior to that date during any scheduled system updates/modifications or when the terminals are brought in for maintenance. All fielded JTIDS/MIDS TDMA Waveform Terminals will incorporate the remapping capability by 2020. The remapping implementation will be flexible, but there will not be a requirement to remap more that 14 carrier frequencies. The remapping capability will be utilized as necessary to prevent harmful interference with ATC systems that have been approved by a NTIA Stage 4 Spectrum Certification. The Legacy JTIDS Terminals (Class 1, 2, 2M, 2H) for operations prior to 2020 are not required to implement the remapping feature.

5. The DOT will ensure that planned and future systems/equipment subject to its jurisdiction that are to be implemented using spectrum not subject to remapping will be designed to satisfy their minimum performance standards in their intended electromagnetic environments. This environment includes JTIDS/MIDS TDMA Waveform systems operating in conformance with the remapping requirement. This will ensure that such new or modified systems shall incorporate features so as to not constrain JTIDS/MIDS TDMA Waveform Terminals operations in accordance with the approved NTIA Spectrum Certification.

6. Coordination procedures for JTIDS/MIDS TDMA Waveform operations involving all 51 frequencies, operations exceeding approved NTIA Spectrum Certification conditions and operations involving non-US and new terminals shall be cooperatively developed by DOD and DOT.

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